THE

AMERICAN GAS-LIGHT JOURNAL

DEVOTED TO

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE.

Iron Buildings, Nos. 254 & 256 Canal Street, East, near Broadway, New York.

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WALTON'S PATENT ANTI-FREEZING APPARATUS,

FOR PRIVATE METERS, GAS-WORKS' MAINS, AND PUBLIC LAMPS.

Fig. 1.

FOR PRIVATE METERS.

By pouring half a pint of Alcohol into the casting, the Meter and Service-Pipes will be kept free from frost during the winter.

This apparatus can be attached to private dwellings and public buildings, at a very small cost, and without disturbing the pipes.

Fig. 3.

FOR PUBLIC LAMPS.

By unscrewing the Burner, and pouring a gill of alcohol down the pipes into the casting under the pavement, the light will be kept free all winter.

Results Guaranteed. See Certificates of the Cincinnati. O., and Louisville, Ky., Gas-Works. in the American Gas-Light Journal, Vol 2, page 63.

Fig. 1.

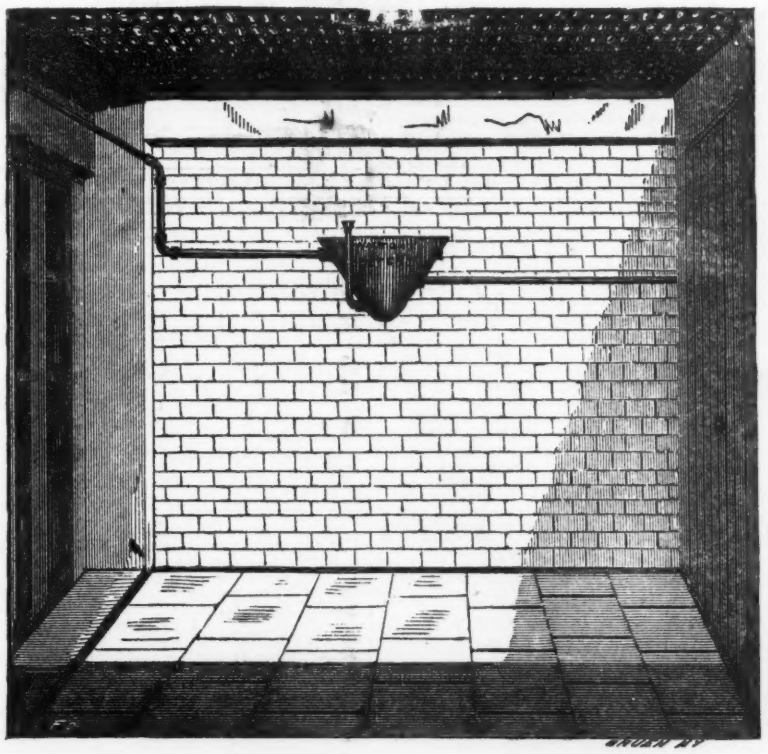

Fig. 2.

Fig. 3.

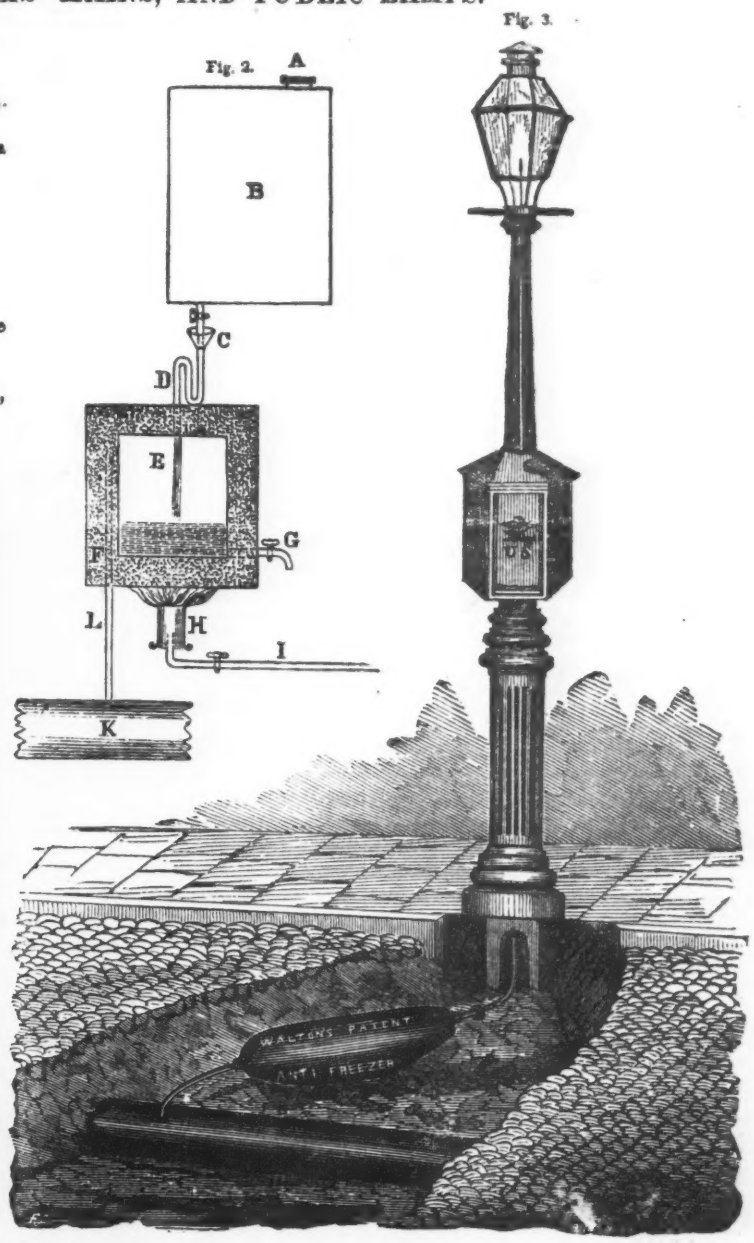

Fig. 2.

DESCRIPTION OF APPARATUS FOR GAS-WORKS' MAINS.

A. Filling Screw to Apparatus for Gas-Works. *B.* Alcohol Tank to be placed on a shelf. *C. D.* Seal-Pipe, 6 or 8 inches deep, to prevent the return of the gas from the main. *E.* The chamber or cylinder in which the alcohol is converted into vapor and from which it passes into the main pipe. *F.* The outer chamber or cylinder filled with sand, to prevent the escape of heat from the alcohol chamber. *G.* The cock by which to draw off any liquid remaining, before refilling the alcohol tank. *H.* One of Krause's Gas-Stoves, to heat the alcohol, when steam is not used. Steam is preferable. *I.* The small gas-pipe, to supply the Gas-Stove. *K.* The gas main, by which the gas leaves the Gas-Works. *L.* The vapor pipe, passing the vapor of the alcohol into the gas main.

Care should be taken to proportion the alcohol to the quantity of gas delivered. The greater part of the gas used, passes from the Gas-Works between the hours of 4 and ten o'clock at night, so the supply from the Alcohol Tank should be regulated to suit the demand, which may be safely estimated at one gill to the 1000 feet, but it *can be determined by the coldness of the weather*, by those using the apparatus, and with proper care, all the pipes used in a Gas-Works, can be kept *free* in the coldest weather, as the principle is the same as that which keeps all the liquors of domestic use from becoming ice in the winter season, to wit, the presence of alcohol. For either or all the apparatus, *Apply to*

HORATIO EAGLE,

Rooms of the AMERICAN GAS-LIGHT JOURNAL, *Nos.* 254 *and* 256 *Canal-st., near Broadway, New-York.*

J. H. BRUNDAGE & CO.,

38 BURLING SLIP, NEW YORK, DEALERS IN

ROSINS ADAPTED ESPECIALLY TO GASMAKERS' USE,

N. B.—J. H. B. & CO. ARE CONSTANTLY PURCHASERS OF ROSIN-GAS TAR.

ADDISON POTTER,
WILLINGTON QUAY,
NEAR NEWCASTLE UPON-TYNE, ENGLAND,
Manufacturer of CLAY RETORTS, FIRE BRICKS, and every description of FIRE CLAY GOODS.

TO GAS-COMPANIES, ENGINEERS, Merchants, Gas-Fitters, Surgical Instrument Makers, &c.
FLEXIBLE GAS FITTINGS.
The existing great demand for Hancock's ENAMELLED or GLAZED FLEXIBLE TUBING, and the increased facilities of manufacturing it, is an assurance of the satisfaction experienced by the public in the use of this article, so extensively made by JAMES LYNE HANCOCK, OF LONDON, who begs now to announce to the trade, that he continues to export, to a large extent, FLEXIBLE GLAZED TUBING for GAS, Surgical and other instruments, now in such general use amongst Gas Companies, Engineers, Gas-fitters and others.
This is the only TUBING that perfectly resists the action of coal gas. It is made of all sizes, from ¼ inch up to 1¼ inches, and in 60 feet lengths. The measure is always external diameter, to connect the usual metal fittings.
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—N. B.—Orders by post, with remittance, or good reference in England, will be promptly executed.

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JOHN ROGERSON & CO., NEW-CASTLE ON-TYNE, Middlesbro'-on-Tees, London, supply Gas Coal, Clay Retorts, Cast Iron Pipes and Retorts, Gasometers, &c. A partner of the above house being now in this city, will be glad to wait upon any gas company requiring supplies. Agents, MEAD & BELL,
17 William street, New York.

COWEN'S PATENT FIRE-CLAY Retorts.
JOSEPH COWEN & Co., Blaydon Burn, near Newcastle-on-Tyne, England, were the only parties to whom a Prize Medal was awarded at the Great Exhibition in London, of 1851, for "GAS RETORTS AND OTHER OBJECTS IN FIRE CLAY."
J. C. & Co. have been for many years the most extensive manufacturers of Fire Clay Retorts in the United Kingdom; and orders for FIRE CLAY RETORTS of all shapes and dimensions, FIRE BRICKS, and every other article in Fire Clay, are promptly executed at their works as above.
COWEN'S GARESFIELD COAL AND COKE.
Coal and Coke office,
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NEW YORK FIRE-BRICK Manufactory. (Branch Works at Kreischerville, Staten Island.)
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PATENT PYRO-CLAY GAS RETORTS. THOMAS HOADLEY, Patentee, wishes to call the attention of Gas-engineers to these Retorts, as a very superior article.
REFERENCES:—Gas-Light Works, Buffalo, N. Y.
" " Cleveland, O.
" " Chicago, Ill.
THOS. HOADLEY, 34 Front st., Cleveland, O.

CELLULAR GAS RETORTS. C. M. CRESSON'S CELLULAR GAS Retorts, Patented October 3d, 1854. Adapted to the manufacture of GAS from Rosin, Coal, Wood, &c., and now in use at the Philadelphia Gas Works. Patent Rights for sale. For information apply to HENRY S. HAGERT, Attorney for Patentee, S. E. cor. of Walnut and Sixth streets, Philadelphia, Pa.

GAUTIER'S CLAY RETORTS.—Fire and Arch Bricks, Gas-House Tiles, &c. Black Lead Crucibles for Steel Works and Brass Founders.
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S. THOMPSON'S Neph., Imp'r, 45 Gold st

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Dealers in Tiles, Arch-Bricks, Furnace-Doors, Mouth-Pieces, Covers, and all other Fittings, of the most approved patterns, for setting Clay Retorts. Sabbaton's Patent Furnace-Doors and Frames, Floyd's Patent Malleable Iron Retort Covers, McKenzie's Patent Gas Exhausters, made by Addison Smith, Compensator Valves, &c. Gas, Water, and Steam Tubes.

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J. K. B & Co. would invite the attention of Gas Companies to the important fact, that the Clay Retorts manufactured at their Works can be set without Tiles, requiring to be supported only at the front and rear ends, thereby exposing the entire surface of the Retort to the direct action of the flame from the furnace.
The results of this mode of setting, are a Saving of Fuel, Tiles, Transportation of Materials, Labor and Space, thereby enabling Gas Companies to set Retorts of at least 50 per cent. greater capacity than those usually employed in the ordinary arches.

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MORRIS, TASKER & CO, Philadelphia.
HORATIO EAGLE, 254 Canal-St., New York.
Or H. K. SYMMES, Newton, Mass.
See Engravings in AMERICAN GAS-LIGHT JOURNAL for July 1, 1860, page 280.

KENNEDY'S Method of Securing Iron Mouth Pieces to Clay Retorts.—any bolt-holes through the flange. An iron collar made in two pieces, is then placed around the Retort behind the flange, and bolted to the mouth piece by bolts which pass just outside of the flange instead of passing through it. As each Retort costs about $30, and as the breaking out of the bolt-holes entirely ruins the whole Retort, the importance of this simple but valuable improvement will be readily appreciated.
By this improvement the mouth-piece is firmly attached to Clay Retorts in a simple and very substantial manner, the bolts passing from the yoke to the mouth-piece on the outside of the Retort. The yokes are furnished at a low price, ready to be put on. For Engravings, see AMERICAN GAS-LIGHT JOURNAL for June, 1860, page 245. Address the Patentee,
JOHN P. KENNEDY, Trenton, N. J.

THE AUBIN GAS-WORKS CO., No. 44 State street, Albany, N. Y., will refer parties wanting GAS-WORKS FOR VILLAGES to seventeen of their Village Works now in operation in the United States, and the Canadas in *every one of which the profits of the company are ten per cent. and upwards, and yet good gas is furnished.* Agents wanted to extend the sale of the AUBIN PORTABLE GAS STOVE for dwellings, factories, &c., which will make 1000 feet of gas in five hours, and with greater simplicity, safety and economy, than any other known apparatus.

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For sale by JOHN JEFFREY, Cincinnati, Ohio.
Street Lanterns cast in three pieces, which are fitted together without bolts, rivets, solder or other fastenings; glazed without tins, putty, or catches; the glass slipping into grooves cast in the lantern. These lanterns have been adopted, and are now used, by the City Councils of Cincinnati, O., Covington, Ky., and other cities.

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Gas-Work Castings of every description.
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Herring & Floyd offer for sale Sabbaton's Patent Screening Shovels for coke and coals, made of malleable iron, of all sizes; Sabbaton's Patent Improved Cast Iron Furnace Frame and Door, arranged to protect the iron work of the door and frame from direct contact with the fire; also Floyd's Patent Malleable Iron Retort Covers, only quarter of an inch thick, but of convex form, and of great strength, as is attested by certificates from several of the leading Gas-works in America. For engravings of all the above patents see AMERICAN GAS LIGHT JOURNAL for October, 1859, pages 65 and 71.
Samples of the above castings can be seen at the Rooms of the AMERICAN GAS-LIGHT JOURNAL.

S. V. MERRICK, J. VAUGHAN MERRICK,
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Particular attention paid to Alterations and Repairs.
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John C. Cresson, Engineer Gas Works, Philadelphia; Joseph A. Sabbaton, Engineer Manhattan Gas Works, New York; Col W. S. Campbell, Engineer Gas Works New Orleans; P. A. Sabbaton, Engineer Gas Works, Albany; Waterhouse and Bowes, Gas Engineers, Raleigh, N. C.; Joseph Battin, Newark, N. J.; C. B. Dungan, Philadela.

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ARTESIAN WELL PIPES,
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Sole Agent For the United States and Canada

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J. C Smythe,	do.	Salisbury	do. do
Arch. McClean,	do.	Fayetteville	do. do.
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Wm. Johnston, President of Charlotte & S. C. R.R., Charlotte, N. C., A. B. Wood, Agent Reading Iron Works, 57 Maiden lane, N. Y., Cornelius & Baker Manufacturers of Gas-fixtures, Philadelphia.
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PORTABLE GAS WORKS.—S. T. McDOUGALL'S PATENT Portable Gas Works, for making Gas from Rosin, Rosin Oil, Coal Oil, Naptha, Grease, etc. These Works combine the latest improvements in gas making, and are guaranteed to be superior to any in market. They are made of all sizes, suitable for either country or city use. No county house is complete without its Gas Works. Gas Stoves of every description on hand and made to order. For sale by S. T. McDougall, 170 Center Street, New York.
Agents wanted in other cities to sell rights or machines.

GAS-LIGHT STOCKS FOR SALE. THREE HUNDRED THOUSAND DOLLARS of Stocks in various Gas-light Companies in the United States, paying from 6 to 12 per cent. dividend, for sale by JOHN B. MURRAY, Rooms of the AMERICAN GAS-LIGHT JOURNAL, N. Y.

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KING BROTHERS beg especially to call the attention of Gas Companies to the superiority of their Retorts, which are made from the celebrated STOURBRIDGE FIRE-CLAY. Mr. King has patented a Kiln for Burning Retorts, by which Patent all Cold Air is excluded from the Kiln while burning, thus rendering them

FREE FROM CRACKS AND CORRECT IN FORM.

By great care in Manufacturing, combined with the advantages in burning, a VERY SMOOTH SURFACE is obtained, rendering them less liable to carbonize

RETORT OVENS, FIRE-BRICKS, GUARDS, SADDLES, RABBITTED BURS, FLUES, AND QUARRIES, ARE ALL MANUFACTURED OF THE SAME QUALITY OF CLAY.

EVERY RETORT AND BRICK IS BRANDED "KING BROTHERS, STOURBRIDGE."

GEORGE WRIGHT & CO.'S

LIVERPOOL AND NEWCASTLE CANNEL AND COAL

FOR GAS MANUFACTURE AND HOUSE USE.

THE undersigned does not submit for comparison the result of chemical analysis, as this plan is too often adopted to promote the sale of inferior or worthless coals that in practice bear no particle of resemblance to their theoretical, and sometimes distorted descriptions.

He is authorized, however, to guarantee the *careful shipment of the best qualities of Cannel and Coal, at the lowest rates of Invoice and Freight offered at time of engagement;* and any losses sustained by short weight, or the neglect of the conditions mentioned, will be promptly and cheerfully repaired.

OFFICE OF THE MANHATTAN GAS LIGHT COMPANY,
New-York, October 8th, 1859.

Messrs. GEORGE WRIGHT & Co., Liverpool:

Gentlemen,—For many years you have acted as agents for this company, purchasing for, and forwarding to them, coals, retorts, and other gas apparatus.

Your experience, ability and sterling integrity, entitle you to and have secured our confidence, and we cheerfully recommend your house to all gas companies desiring the services of an agent in England. My own personal knowledge of the superior quality of the coals within your control, and my acquaintance with the manufacturers of such articles as can be advantageously procured by you in England for gas companies abroad, added to my high regard for you personally, induce me to write this letter, and express the hope that you may be able to extend your business in this country, not only for your own advantage, but also for the benefit of those who may confide in you as securely as we have done.

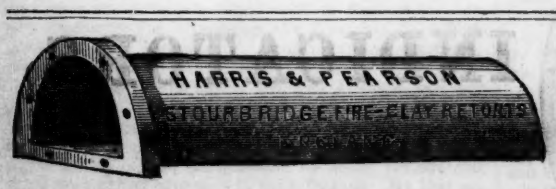
I am, gentlemen, your very obedient servant,

CHARLES ROOME, *President.*

T. W. PARMELE, Agent,
No. 4 Irving Place, New-York,

GAS-EXHAUSTERS,

GOVERNORS, FURNACE DOORS,
RETORT-COVERS, CASTINGS,
IMPLEMENTS,
PHOTOMETRICAL AND METER-PROVING APPARATUS.



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PROPRIETORS OF

BEST GLASS-HOUSE POT, AND CRUCIBLE CLAY.

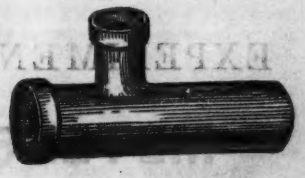
Manufacturers of Fire-Bricks, Gas-Retorts, and Glass-House Furnace-Bricks of every description.

PAMBLECOTE FIRE-CLAY AND BRICK WORKS, STOURBRIDGE, ENGLAND.

GAS, STEAM, SMOKE, PURE WATER AND SOIL PIPE,

CLAY RETORTS, TILES, BRICKS,

AND EVERY VARIETY OF FIRE GOODS.



JOSEPH CLIFF,

WORTLEY FIRE-BRICK WORKS,

Near Leeds, England.

T. W. PARMELE, Agent, No. 4 Irving Place, New York.

MEDALS AWARDED TO THOMAS GLOVER'S PATENT DRY GAS-METERS.

MANUFACTORIES

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THOMAS GLOVER introduced his PATENT DRY GAS METERS into the United States and Canadas in 1846, and since that time he has received extensive patronage from many Gas Companies of those countries as well as from this. Thomas Glover confines his sole attention to the business of Gas-Meter making. The propriety of his doing so is satisfactorily proved by his success. For example: one London Company has now in use above 12,500 of his Patent Dry Gas-Meters, and some of these Meters have been fixed for fourteen years and are still in working order, without complaint from either the company or the consumer.

THOMAS GLOVER thinks it necessary to put Gas Companies on their guard against parties selling Patent Dry Gas-Meters constructed in imitation of his, but unskilfully made on erroneous principles, and with improper and unsuitable materials.

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Pressure-Registers, Pressure-Indicators and Gauges, Station, Show, Customer, and Experimental Gas-Meters, Centre or Hydraulic Valves, Governors, Compensators for Exhausters, and the Standard Testing Gas-Holders* for Proving Meters, now used in the State of New York in compliance with an Act of the Legislature. Also, Bunsen's Photometer, with complete Apparatus for working the same.

*The standard of measurement of this Gas-Holder is given by Professors TORREY, of the U. S. Assay Office; JOY, of Columbia College; GIBBS, of the Free Academy and several other distinguished scientific gentlemen.

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MANUFACTURERS OF

WET AND DRY PATENT **GAS-METERS,** STATION, SHOW, CUSTOMER, AND EXPERIMENTAL **METERS,**

PHOTOMETERS, PRESSURE REGISTERS, **INDICATORS,** AND GUAGES, GOVERNORS, METER PROVERS, CENTRE SEALS, FLUID GUAGES, &c.

The flattering Testimonials we are receiving from Gas Officers, accompanied with expressions of such general satisfaction, and the fact of a tried experience for fourteen years, must present itself as a security to parties desirous of securing the most reliable Instruments. We therefore recommend our Patent Dry Gas-Meter, believing it superior to any Meter manufactured. Messrs. J. LENNIG & Co. confine their sole attention to the business of GAS-METER making.

Our materials are the best in use; the strictest attention is given to workmanship, and we guarantee entire satisfaction to all purchasers.

Purchasers may at any time inspect our Works, and the materials of which our Meters are manufactured. We are fully prepared to execute all orders, upon the shortest notice, and it will be to the interest of parties to call upon us.

☞ Each Meter Tested Separately by a Sworn Inspector, and Sealed when desired. ☜

METERS REPAIRED AND FORWARDED WITH DISPATCH.

THE GAS QUESTION IN NEW-YORK.

The price of gas, in this city, is altogether too high. Since the reduction, three or four years ago, from $3 to the present rate, the economies of the manufacture have made no small progress, and the charge for this extensively-used article being now higher in New York than in Boston, Philadelphia, and some other cities, the public will not be surprised to learn that our gas companies are beginning to feel the pressure from without, especially as considerable excitement has been recently produced relative to gas exactions, and one or two new companies are starting up and threatening to put an end to the long-enjoyed monopoly. The Manhattan Company has just referred the price of gas to a Special Committee, and there is little doubt of an early change. Two dollars per thousand cubic feet is the rate which will probably be fixed. A lower price has in some quarters been looked for. But, so long as most of the coal distilled has to be brought here from mines 3,000 miles off, there is but little chance of any but inferior coal-gas being supplied in this city, at a price below that we have named. In London the rate charged is about $1 08, and as most of our gas-making requisites have to be purchased in Europe, the first cost of gas here amounts, at present, to about twice as much as in the capital of Great Britain. If then, our gas companies will supply a pure, rich article at $2, the public, in the existing state of the manufacture, will not be disposed to complain, and the increased consumption induced cannot fail to render the change advantageous to all parties. Until coal-gas is discarded, and we see the general introduction of some method for the cheap production of illuminating gas from other materials, a further decrease in price can scarcely fail to involve some mischievous falling off in quality.

Considering the nature of those abominable compounds, offensive in odor hurtful to health, corroding to metallic surfaces, mischievous to gilding, and destructive to ornamental furniture, which in Europe and in this country have sometimes been sold as illuminating gas, the consumers will not allow the cheapening of the article here to detract from its purity. Let us have gas at the lowest remunerative prices; but by no means give us any but the best. Those subtle poisons which are present in coal-gas from the instant of its generation are set free by the process of combustion, if not previously got rid of. Whether perceived or not by our senses, these active miasmatic agents mingle with the air, penetrate the lungs, predispose to disease, and sap the foundations of life. At whatever cost, such mephitic superfluities should be taken out of the material used to give light in our offices, sick-rooms and hospitals, in our churches, our theatres, and our homes.

Let us not be misunderstood. We are not complaining of the quality of the gas supplied in this city. Our object is merely to give due prominence to an important aspect of the gas question, and in anticipation of a diminution of price, to demand, in the interest of the public, an adherence to the present high standard both of brilliancy and purity. Every person conversant with the subject is aware that the companies of New-York, by availing themselves of the skill and knowledge of eminent chemists, and by other fit means, have acquired the reputation of producing an illuminating agent of superior excellence, while the price has been gradually lowered from ten dollars to one-fourth of that price. An easy demonstration establishes the fact that New-York gas is richer in illuminating properties than that supplied in Paris or London; and photometric tests prove that a thousand cubic feet of ordinary London gas will give no more light than two-thirds of that quantity of the gas used here. This superiority our consumers will on no terms sacrifice. For it is both a public benefit and a result of the introduction of more perfect and more economical processes of manufacture. By that untiring energy which is a prominent characteristic of our countrymen, by able management, a vast capital, a progressive policy, and the use of every valuable improvement discovered in America or in Europe, the gas companies of the city of New-York have taken a position second to none in the world. Hence they are becoming the frequent resort of those who seek the most complete information, and the most reliable schools for training in this specialty.

While granting all this, however, to the genius and enterprise of our gas companies, we must remind them how important it is in the present new phase of their existence that all fit and possible concessions should be freely made to the public. The best results will inevitably follow if these companies will adopt in their commercial relations the same liberal policy which has made them great and prosperous in their internal operations. And there cannot be a doubt that the present time is singularly favorable for the inauguration of this policy. Let them not forget that consumers are waiting with some impatience to hear an early confirmation of the report that the charge for meters is to be discontinued. The tide of public opinion sets strongly against this action. And although the meter-rent is not contrary to law, still the gas companies will do well to forego a source of revenue which is so unpopular, and so offensive to their customers.—*N. Y. Times, Aug. 4.*

SEWERAGE OF NEW-YORK, BROOKLYN, AND PHILADELPHIA.

To the Hon. City Council of Cincinnati:

GENTLEMEN: The undersigned, one of your Committee on Sewerage and Drainage, having recently had occasion to visit several of the Eastern cities, and being desirous of obtaining correct opinions in regard to the sewerage and drainage of those cities, prevailed upon our City Civil Engineer, Mr. Gilbert to accompany him, and aid by his professional experience and knowledge in the inquiries he might be able to make. We were accompanied also by His Honor the mayor, and together made it our business, during the short time that Mr. Gilbert could remain with us, to devote our attention almost exclusively to the subject of sewerage in Philadelphia, New York and Brooklyn. And here I take pleasure in saying that though clothed by no special authority by our Council, and visiting only as citizens of Cincinnati, we were given every facility by the municipal authorities of those cities for the examination of the subject of our visit, with great cheerfulness and in the spirit of the most enlarged liberality. Believing this subject to be one of great importance to our city, I feel it my duty to state in as brief a manner as possible the facts elicited by our investigations, only premising this much, that the more I have examined the matter the more I am convinced that the question of City Sewerage is one of the most important which claims the attentive consideration of the municipal authorities of our large cities.

PHILADELPHIA.

First, in regard to Philadelphia. We find that previous to the consolidation of the city, which took place in 1854, no plan for general drainage had been arranged, but sewers were built with a view to the then present wants of the city; and since the consolidation the endeavor has been to adapt former works to something like a system, and arrange new works to meet the wants of the future as well as the present. The system which the experience of Europe has demonstrated as the best, by brick sewers for the mains and glazed stoneware pipes for the lateral drains is the one now being gradually introduced by the Chief Engineer of the city of Philadelphia, Mr. Kneass. A large main sewer of brick, ten feet in diameter, was in progress of building at the time of our visit. This is intended as a main for a very large area of 1,959 acres, and is upward of one mile in length, with a fall of only 37-100 of a foot in each 100 feet. The smaller sewers, for the drainage of lateral streets, and tributary to the mains, are glazed stoneware pipe, one foot in diameter—a glazed pipe of eighteen inches diameter being considered by Mr. Kneass, who has charge and arrangement of all sewers, as equal in capacity to a brick sewer of three feet interior diameter.

In such cases where sewers are built, the property owners on each side of the street are taxed seventy-five cents per front foot to pay for the same, whether the sewer be large or small. An annual rent also of from one dollar to ten dollars is charged parties using the drains and sewer.

Since the consolidation of the city it has been divided into twelve districts, in each of which is elected a city surveyor. These twelve surveyors, together with the Chief Engineer, constitute a Board somewhat similar to our Board of City Improvements, to whom are referred all parties in regard to sewers and improvements, and each surveyor in his respective district superintends the construction of these works, and certifies the same to the Chief Engineer. Private parties frequently build drains in the streets at their own expense, subject in their construction, location, size, &c, to the approval of the Board. We found all the inlets answering somewhat to our well-holes at the intersection of the streets, and trapped to prevent the escape into the streets of foul gas, and also to prevent rubbish and filth from streets entering the sewer, each inlet having what is termed a "catch-basin" to secure the rubbish and washings of the street, and which, when filled, is cleaned out by the street scavengers. The inlets now used in Philadelphia are formed of cast iron, and are considered a very perfect arrangement and complete success. All matters of a fluid or semi-fluid character are passed into these sewers and drains; and Mr. Kneass is urging strongly upon the city Councils the propriety of taking steps immediately to prohibit the use of cess-pools in the built up portions of the city altogether.

The total length of sewers now built and in operation in Philadelphia is estimated at something over three hundred miles.

NEW YORK.

This city has at present some four hundred and ninety miles of sewers laid, but not according to any well arranged system. Sewers are built as petitioned for, and the authorities having charge of this branch of improvement adapt them as best they can to the works heretofore built. They are generally laid throughout the city, however, but the sewerage is not as complete as that of Philadelphia and Brooklyn. The sewers are mostly of brick, oviform in shape, and they have been constructed frequently without reference to the future demands and wants of the population. Every effort is now being made, however, to remedy this defect. The cost of building the sewers is borne by the property adjacent, the city paying the contractor, and then collecting the amount from the property owner. Nevertheless a discretionary power is given the authorities having the matter in charge, as to whether the whole cost of the work shall be assessed upon the property. In some cases the city pays a proportionate expense, as may be determined by the officer.

BROOKLYN.

The city of Brooklyn is situated somewhat similarly to our own in regard to having a good elevation for drainage, and with a population of about 250,000, approximates more nearly our own city than any of the others.

The city authorities have adopted for Brooklyn a complete system of underground drainage for the whole city, and calculated for all extensions which the growth of the city will demand. This system is the result of the combined experience of several of the most accomplished engineers of the cities of New York and Brooklyn, aided by the experience derived from European cities, and is probably as perfect as can be obtained at the present time. This system consists of brick sewers for the mains, and glazed stoneware pipe for the lateral drains. The largest sized main is a circular sewer of six feet interior diameter, which is calculated to drain about 3,000 acres of town area, and has a fall of but two feet per mile, and is about two miles in length. The smaller bricks sewers are egg-shaped, and the lateral drains glazed stoneware pipe twelve and fifteen inches in diameter; the connections with houses, &c., six-inch pipe.

The work is done under the direction of a Board of Sewerage Commissioners who were organized under an act of the Legislature empowering them "to devise and form a plan of drainage and sewerage of the whole city upon a regular system for the purpose of thoroughly draining and carrying off the water and filth proper to be carried off by sewers, for the health and convenience of the inhabitants of said city." The Board are authorized to borrow such sums from time to time to meet the cash outlay in the construction of the sewers, (in anticipation of the collection of assessments,) not to exceed five hundred thousand dollars outstanding at any one time, upon bonds issued by the city, and bearing interest not to exceed six per cent. per annum, and payable in not more than three years.

The Board of Sewer Commissioners are required by the act "to lay out the whole city into sewer districts; each district to consist of a main or principal sewer, having its outlet in the river or bay; and all branches of such main sewer and the collateral or inferior sewers running into the main sewer; and said districts shall be so arranged as to be independent of each other as far as may be" The sewers, when constructed, are paid for by assessment upon all the property in the district so drained; a percentage for collection being added to the assessment on the cost of constructing the sewers. Brooklyn has now between seventy and eighty miles of sewers, built under the direction of this Board within the last two years, and in accordance with the plan adopted. In these cities, Philadelphia, New York and Brooklyn, the city is responsible only for the main and lateral sewers laid down in the streets, the connections with houses, &c., being put in at the expense of the property owners, who are alone held respensible for their efficient action.

It may be thought, after these investigations, I should suggest some action on my own part, but this I do not now propose to do without further consultation with the other members of the Committee and the City Civil Engineer, further than to urge the recommendation made by the present City Civil Engineer, in his report upon the subject of Sewerage, made to Council in March, 1852, viz.: "The adoption of some plan for the proper and complete sewering of the city, which shall be simple in general principle, uniform in its detail, and thorough and efficient in its action; such a plan as we can work by and conform to, and will meet our wants in our present state, which may grow with our growth, and which can be completed at any time hereafter, as the necessities of the city may require, and which, when finished, will present an uniform system of complete drainage." What this plan shall be, and how obtained, is a matter for serious consideration, and your Committee will endeavor to take such steps as will lead to some action in regard to it at as early a day as possible. In the meantime, we purpose to build sewers on Vine and Walnut streets immediately, the plan and specifications of which have been proposed by the City Civil Engineer, and approved by your Committee. Advertisement proposals for their construction will be issued by the Board of City Improvements at once.

Respectfully submitted,
HENRY MACK,
Chairman Committee on Sewerage and Drainage.

MILWAUKIE, WIS.—Works were built by J. Lockwood, but have been greatly improved and enlarged by the Company; they use iron retorts, made by Starr; Gratz's, Glover's and Down's meters. Length of mains fifteen miles, ranging from three to ten inches. They use Pittsburgh coal at $5 per ton, and made about 22,000.000 cubic feet of gas in 1859. This company divides 10 per cent. per annum, and pays its New York stockholders semi-annually at the Phœnix Bank in this city.

MONTREAL, C. E.—This is called the New City Gas Company. The works were built by Mr. W. R. Falconer, and are reported to be quite satisfactory. A large proportion of gas-works' castings used in the Canada works have heretofore been imported from England. They use Cliff's clay retorts in part, and also iron retorts made by R. Laidlaw & Sons, Glasgow, Scotland; Edge's (London) station meter, Crosley's and Glover's, (both London) customer meters. They are doing away with wet meters entirely. Newcastle coal at $6 a ton is used, with 10 per cent. of Boghead at $11 per ton. Number of cubic feet of gas made last year was 41,125,000.

BI-SULPHIDE OF CARBON IN COAL GAS.

By A. W. Hoffmann, Esq., Ph. D., F.R.S., &c.

From the Quarterly Journal of the London Chemical Society.

It is well known that coal gas even when submitted to the most improved processes of purification, retains a minute quantity of a sulphur compound, which yields sulphurous acid when the gas is burned. A commission having been appointed for the purpose of reporting* to the Lords of the Committee of the Privy Council on Education on the lighting of picture galleries by gas, and on any precautions (if necessary) against the escape of gas and of the products of its combustion, the writer of this note undertook a few experiments, with the view of determining the amount of sulphur generally present in the London coal gas.

The object of the inquiry being to ascertain the quantity of sulphurous acid capable of being formed by the combustion of the gas, an exceedingly small jet of gas, carefully washed with acetate of lead—which showed the absence of sulphuretted hydrogen—and measured by an accurate experimental metre, was measured in a large two-neck d glass globe. Through one of the necks the gas tube was conveyed into the globe, whilst the other, fitting into a condenser, carried off the product of combustion into a two-necked receiver. To establish a current of air, the receiver was connected with a water-current aspirator, a couple of Woolfe's bottles, containing water or dilute ammonia, being inserted for the purpose of fixing any trace of sulphurous acid which might escape condensation, with the water in the receiver. The experiment being terminated, the liquids in the receiver and in the wash-bottles were united, oxydized with chlorine, and precipitated with chloride of barium.

Experiments in July, 1859.

Order of Experiments.	Quantity of Gas consumed.	Amount of Sulphate of Barium.	Amount of Sulphur in 100 Cubic Feet.		Amount of Sulphur in 100 cub. m.
	Cubic F..	Grammes.	Grammes.	Grains	Grammes.
I.....	1·98	0·0630	0·427	6·74	15·433
II.....	2	0·0840	0·577	5·90	20·371
III.....	2	0·0630	0·433	6·68	15·278
IV.....	2	0·0740	0·503	7·84	17·944
Mean.....	.....	.....	0·483	7·54	17·256

Experiments in December, 1859, and January, 1860.

Order of Experiments.	Quantity of gas consumed.	Amount of Sulphate of Barium.	Amount of Sulphur in 100 Cubic Feet.		Amount of Sulphur in 100 cub. m.
	Cubic Ft.	Grammes	Grammes.	Grains.	Grammes.
V.....	2	0·0890	0·611	9·43	21·585
VI.....	2	0·0953	0·654	10·10	23 111
VII.....	2	0·0975	0·669	10·33	23·644
VIII.....	2	0·0935	0·642	9·91	22·677
Mean	.....	.....	0·644	9·94	22·754

These experiments show that the amount of sulphur remaining in the London gas after the removal of the sulphuretted hydrogen is very small, and that in winter it is somewhat greater than in summer. This may possibly arise from the enormously increased production of gas during the winter months, when it will be more difficult to regulate the different processes involved in its manufacture. But the result may also be purely accidental, arising from a change in the nature of the coal used, &c. A much more extended series of experiments would be required to decide this question.

It has long been assumed that the sulphur in purified gas exists in the form of bi sulphide of carbon, the conditions for the generation of this carbon being in fact, given in the ordinary process of producing gas. That coal-gas really contains bi-sulphide of carbon was first elegantly proved by Vogel,† who, at the suggestion of Baron Liebig, passed a current of purified gas through an alcoholic solution of potassa, when xanthate (sulphocarbonate) of potassium ($K(C_2H_5)CS_2O$) was formed, which produced in copper solutions the highly characteristic yellow precipitate of xanthate of copper, and yielded, when boiled with a few drops of nitrate of lead in the presence of free potassa, a black deposit of sulphide of lead. When engaged in the above inquiry, I repeated Vogel's experiments, which I can confirm in every particular. The amount of bi-sulphide of carbon in the London gas is, however so small, that a very large volume must be passed through the alcoholic solution of potassa in order to produce a sufficient quantity of xanthate of potassium. After a cubic foot of gas had been put through alcoholic po assa in a bulb apparatus, the solution gave with sulphate of copper a leek green precipitate, in which the presence of xanthate was but imperfectly indicated. Only after passing several additional cubic feet the yellow color become more distinct, although still masked to some extent by the hydrated protoxyde simultaneously precipitated. On the other hand, the black precipitate of sulphide of lead was obtained without difficulty, even after the passage of one single cubic foot of gas.

But the presence of bi-sulphide of carbon in coal-gas may be exhibited even more elegantly, and with greater precision, by means of *triethylphosphine*, which produces with the bi-sulphide a compound crystallizing in splendid prisms of a ruby color. This body is so characteristic, and forms with so much facility, that bi-sulphide of carbon has become a most valuable re-agent for triethyl phosphine and its homologues. The idea naturally suggested itself to employ the phosphorous-base for the detection of bi-sulphide of carbon in gas. On distilling a considerable proportion of coal-gas benzol, I had separately collected a small fraction, which came over in the commencement below 65°. When mixed with triethylphosphine, this liquid solidified into a mass of the well-known ruby crystals. Four or five drops of triethilphosphine were dissolved in ether, the ethereal liquid was introduced into a bulb apparatus, and a current of coal-gas allowed to bubble through the solution. When 0·2 of a cubic foot had passed, the liquid had assumed a distinctly red coloration, the intensity of which increased as the passage of the gas and the evaporation of the ether continued. After 0·8 of a cubic foot had passed, the whole of the ether had evaporated, and the inner surface of the bulb apparatus was lined with a beautiful net-work of the ruby crystals.

* Report on the subject of lighting picture galleries by gas, by Professors Faraday, Hofmann and Tyndall, Mr. Redgrave, R. A., and Capt. Fowke, R. E.

† Liebig's Annalen, lxxxvii. 209.

For the American Gas-Light Journal.

THE AGE OF GAS-LIGHT.

Poets sang and artists painted the glories of the golden age when the earth brought forth spontaneously all the comforts of men—such as they then were—fitted, perhaps, to the times when mankind was content with eating and drinking. The Silver Age, more sonorous than its predecessor, looked a little beyond the admonitions of the stomach—the ears and eyes came next to demand the rights of the body politic, and mankind was thereby initiated into the tactics of progress. The Brazen Age, however, usurped its place, and soon ran its predecessor's laudable ambition into the Era of Iron. The ferruginous tyrant rusted civilization down into a barbarous sesqui-oxide, but the water of christian civilization restored it to its pristine beauty and prepared it for the Age of Spirituality, of Life and Light. It developed the Age of Gas.

How beautifully the physical, the moral and the mental world travel side by side. While steam rushes us through the world with hurricane speed the hydro-carbons light the way, and the press symbolizes the thoughts of the speaking magnet. This Gas Light Journal carries light to men's understandings, and the understandings of men—of aggregated men, prompt them to erect Fountains of Light, to illuminate the homes and firesides of whole communities. Like the immortal Goethe, the cry of light! more light!! more light still!!! becomes the theme of forward-marching mankind.

We have fairly entered the Era of Light—the age of etherial progress—the age of spiritual vitality. While steam has taken upon itself the labor of the hands, and gas has turned the dreary night into radiant light, mankind has assumed the prerogative of thought. The American Gas Light Journal, that carries this upon its face to all the quarters of the globe, is the offspring of a thought—a brilliant thought—a thought that dispenses light and life into all the dark recesses of our great empire. What is the motive power of all this but spiritual light? We have fairly entered the Age of Gas, ponderous matter has become subordinate to the manipulatory wonders of caloric, working through the sinews of water and sinews of atmosphere, while gases furnish the intellectual man with vitality and light—the oxygens with mental vigor, the hydrogens with light and buoyancy, reversing, as it were, the ponderous for the imponderous, and giving him *levitation* enough to equilibriate the downward tendency of the universal law of gravitation.

We have gas-light and electric-light, and calcium-light, and latterly, we are to be blest with magnesium-light; not by the cubic foot, but literally by string measure, at so much per yard, all wound round a bobbin like Clarke's patent thread. Who can gainsay that this is the age of light and knowledge, when a man may take from his pocket a bobbin of a thousand yards of illumination as brilliant as the light of Arcturus.

M. Bunsen, of Paris, says a wire of magnesium, only one hundredth part of an inch in diameter, while burning, gives light equal to that of 74 stearine candles of 5 to the pound. Who will be without light upon that discovery? No gas-bag wanted in this case. No high pressure condensed gas-holders, such as the gas-mortars, etherial bomb ketches, in the bottom of rail cars, breathing with terrific admonitions at the passengers over them, ready to send them to another sphere upon the wings of carburetted hydrogen. If M. Bunsen, of Paris, can do what the newspapers say he can do, give us the pocket book full of magnesium wire, that will light us through the defiles of the Rocky mountains, he deserves to have a seat alongside of Aurora. Silliman's principles of chemistry says, "Magnesium is a white metal, malleable and brilliant. It fuses with a red heat, and if heated to redness in the air, burns with a brilliant light." The only question with this pocket light-house now seems to be the cost of this wire per yard.

While the wonders of chemistry gives us hydrogens in variously compounded and attenuated forms, it is also now giving us this ethereal fire in a metallic compact form. A foot of this wire holds more of the elements of fire-flame than ten gallons of carburretted hydrogen. This metal is extremely light. Its "hydrate is found beautifully crystallized in thin pearly plates, at Hoboken New Jersey."

While every one of the twenty or thirty thousand, towns and villages on our continent will ere long be supplied with a gas-works, there will be still plenty of room left for the working of genius in furnishing a locomotive, or rather a *vade-mecum*, light Besides this, we want cheaper light for our cities and our dwellings. We want a heater to warm our houses, that will at the same time give us the flame of the fire to light them with. The Age of Gas Light demands this from the hands of Genius, and he who is fortunate enough to invent the means and appliances, will illuminate his fame and the world simultaneously, and fill his pockets with the brilliant results. Light mental, and Light physical, is destined to make this earth a heaven, and to raise mankind a grade higher.

John Wise.

Lancaster, Pa., July 12, 1860.

MINING COMPANIES AND THEIR WORKS.

The first and most important of these is the Trenton Iron Company, (formerly Cooper & Hewitt,) who employ nearly 300 men in mining at Ringwood, Andover, Roseville, the Schofield, the Dill, the C. S. Dickerson, the Allen, and other mines, besides purchasing ore from private individuals. With the exception of small quantities used in the forges near Ringwood, the whole is sent west to Philipsburg, on the Delaware river, where their furnaces are situated. These are supplied with coal from the Pennsylvania fields, and the softer ores from that State to mix with those from New Jersey. The three now in blast are expected to make over 25,000 tons of pig metal the present year. By the Belvidere road this is sent down to the Company's rolling mill and wire mill in Trenton, where it is made into beams, railroad bars, and wire of all numbers. Nearly one thousand men are employed by this Company at their various works.

The Boonton Iron Works (Fuller, Lord & Co.) employ about one hundred men at the Sweede, Mount Pleasant, Mellen and Orchard mines, all of which are situated near Dover. The aggregate product of these will be about 19,000 tons this year. The ore is shipped to the Boonton furnaces, where, after smelting, it is rolled into thin plates and cut into nails and spikes, of which more than 10,000 tons are made annually. The number of employees at these works is over 500, most of whom work by the piece. The want of a railroad to this large establishment and thriving village has long been felt, and an effort is now, we are happy to say, being made to meet it, with every prospect of success.

The Glendon Iron Company of Easton, Pa., have leased the Hurdtown mine, and the Ford mine, and the Hibernia mine, besides purchasing largely from the Irondale, the Succasuny, and others.

The Crane Iron Company, whose works are also on the Lehigh, have leased the Byram mine, four miles west of Dover, and also purchase ore from other parties. The numbers employed, and the quantities of ore raised annually at these mines are about as follows: Hurdtown, 50 men and 16,000 tons of ore; Ford and Schofield, each about 25 men and 7,500 tons; Succasuny, 30 men and 8,500 tons; Byram, 40 men and 16,000 tons; Irondale, 75 men and 16,000 tons; the Hibernia (Glendon) about 13,500 tons; ditto, (Wood's) 20 men and 8,000 tons; the Richard (Thomas Iron Company's,) 40 men and 11,000 tons; the Mount Hope, about 60 men and 2,000 tons. These are in addition to the mines worked by the Trenton and Boonton Companies, as well as a score of others of less note, carried on by various individuals. The aggregate product of the New Jersey iron mines cannot be less than 150,000 tons per annum, employing as miners, laborers, teamsters, &c., from 800 to 1,000 men; and in the forges, furnaces, and other iron works of that State, between two and three times that number. With present facilities these worgs could easily meet a demand of 250,000 tons of ore, or 150,000 tons of pig iron annually.—*Phil. U. S. R. R. Mining Register.*

Newton, Mass.—John Ford and Co. are the builders of these works, which, although in some respects well built, required very extensive repairs, which, with many improvements, were made by Mr. H. K. Symmes, the present efficient superintendent. During the first year of the operation of the works, over 50 per cent. of the gas was lost by leakage and condensation: this loss has been since reduced to with n 20 per cent., and the business and profits of the Company have steadily increased under the present judicious management. Iron retorts, made by Bisbee & Endicott, are used, and the Boston Gas Meter Company's and Gratz's meters; also Picton and Cannel Coal at $5 36 for former and $14 50 for latter, per 2,000 lbs. Gas made in 1859 amounted to some 3,000,000 cubic feet.

Middletown, Ct.—Works erected by S. S. Battin & Co. The castings are the same as are used in the Albany, N. Y., Charleston, S. C., Hartford, Conn., Newark, N. J., New Haven, Conn., Paterson, N. J., Rochester, N. Y., Washington, D. C., and other works built by that firm. Use iron retorts. Liverpool gas coals, costing $8 25 per long ton; Down's meters; and have 4 miles of mains, ranging from two to six inches. About 2,500,000 cubic feet gas were made at these works last year.

CORRESPONDENCE.

HYDRO-PNEUMATIC REGULATOR.

GAS-WORKS, BONESS, SCOTLAND, 18th July, 1860.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

I believe there was in your issue for February, an article, recommending the use of exhausters for the purpose of lessening the pressure on gas retorts. With the sentiments stated in that article, I concur, especially where you say that "it would, however, be dangerous to remove all pressure from the retorts, since, in case of accident, atmospheric air might enter them in sufficient quantity to cause a serious and destructive explosion. The action of the exhauster, therefore, requires to be accurately registered and placed under perfect control."

As you further "propose to discuss more fully the important functions of the exhauster and to indicate some of the ingenious improvements which have been made" and invite "communications on the subject," I venture to forward to you the following notice of an invention of mine which was brought into use in these Works, a few years since, and which has fully realized my expectation of keeping "the action of the exhauster under perfect control."

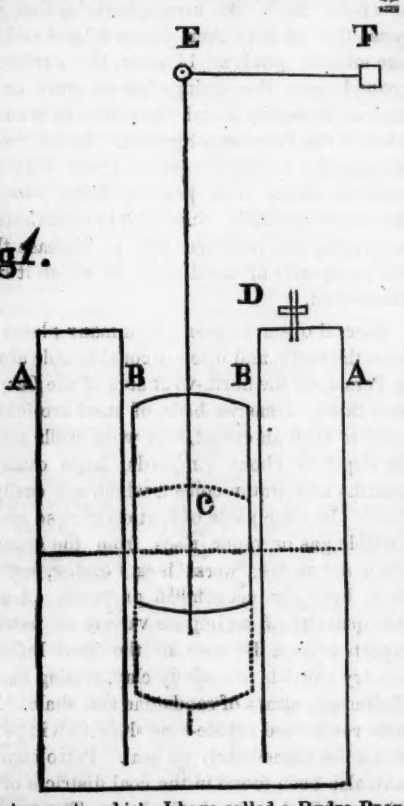
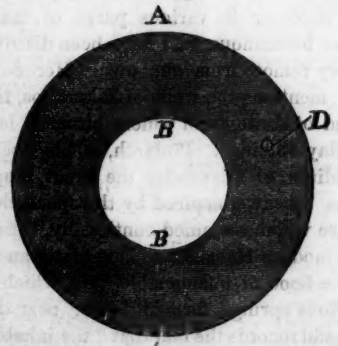


Fig 1.

The instrument—which I have called a Hydro-Pneumatic Regulator—consists of a double cylindrical vessel of tin iron, of which the accompanying sketch, fig. 1, shows the elevation, and fig 2, the end view on the top.

Fig 2.



The outer cylinder, (AA) is closed at the lower end; the space between it and the inner cylinder, (BB) is closed at the top, (see fig. 2) The inner cylinder, (BB) is open at both ends, and being shorter than AA, leaves a space at the bottom all round for the free passage of water with which the vessel is half filled, (more or less, according to the number of retorts to be exhausted,) as shown by the dotted line. Another cylinder, (C) closed at both ends, and perfectly air-tight, to act as a float-works within the cylinders, (BB). A small pipe (D, fig. 1,) from the hydraulic or from the pipe leading to the exhauster, is inserted into the space between A and B, by the aperture (D') fig. 2, by means of which the space between the cylinders A and B is filled from the water line upward with gas. Through the float, (C) passes an iron rod, which is connected by the joint, (E) with another rod, which is attached at F to the throttle valve of a steam engine in the same way as the ordinary ball governor.

When the exhauster is in action, it draws off a portion of the gas contained in the space AB. The pressure of the atmosphere, in BB, forcing the water upwards in the space, AB, and causing the float to sink, as shown by the dotted lines, by which the throttle-valve is partially closed, and the motion of the engine checked in proportion.

When the retorts are newly charged and the gas evolved in great quantity, the consequent pressure on the surface of the water in the space AB, will cause the float, C, to rise in the same proportion, open the throttle-valve and increasing the speed of the engine, and, consequently, the action of the exhauster. As the make of gas decreases, so will *that* in AB be drawn off, and the float will consequently sink, gradually closing the throttle-valve, till should the produce of gas cease, the engine will be brought to a dead stop, even were the steam at full pressure; the action of the exhauster ceasing, of course.

The dimensions of the regulator in use here, are: Outer cylinder, AA, 16 inches deep, by 12½ inches diameter; inner cylinder, BB, 15 inches deep, by 7½ inches diameter float; 8 inches deep by 6¾ inches diameter. The rod passing the float is ¼ of an inch in diameter. The cost of the whole about 16 shillings, ($4·00).

The reason why I have not sooner forwarded this, is that, having had the first number of your JOURNAL sent to me, I ordered all that were issued, and received 11 numbers more, consequently, your 8th number was a long time published before I saw it. On looking over the subsequent numbers, however, I see no further reference made to the subject, and will be glad if my communication be in any way useful.

I am, sir, yours truly,
MALCOLM NAISMITH,
Gas-Engineer.

ANALYSIS OF THE PRAIRIE GAS-STONE.

OFFICE OF THE MASSACHUSETTS STATE ASSAYER, BOSTON, July 24th, 1860.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

I have analyzed some specimens of the "Prairie-rock of Illinois," about which so much has been published in the newspapers. It is simply a porous, grayish-white limestone, impregnated with petroleum, which fills the cells of the stone. There is no nitre in it, notwithstanding assertions to the contrary. Indeed any chemist would see the absurdity of the statements which have been made in the newspapers, for a rock containing bitumen and nitre could not be made to give illuminating gas by heat, but would *deflagrate* and produce carbonic acid, vapor of water, nitrogen, and nitrous acid gases.

I found, on analysis, that one thousand grains of the rock contained sixty-seven grains of petroleum, which were perfectly dissolved by means of benzole, leaving no traces of bituminous matter in the stone. One hundred grains, searched for nitre, gave no trace of it, but a little carburet of soda, an alkali often found in small proportions in petroleum.

When the stone, charged with the petroleum, is suddenly heated, it gives out carburetted hydrogen readily, the richest pieces of it yielding 10 per cent. of gas—a proportion vastly below the yield of ordinary coals.

Distilled at a moderate heat, the rock yields naphtha, which, on redistillation, forms soda of good quality, and like that obtained from the ordinary petroleum from Virginia and Ohio.

I suppose the so-called "oil wells" are bored into this rock, and that the petroleum collects in the bored hole, and is floated up by the water.

Some of the richest of the bituminiferous limestone may be worth distilling for naptha.

There is nothing else remarkable about the "prairie stone."

Respectfully, your obedient servant,
CHARLES T. JACKSON, M.D.,
State Assayer.

FOREIGN NEWS.

IMPROVEMENTS IN GAS METERS.

Mr. David Hulett, of No. 55 and 56 High Holborn, London, gas engineer, has recently patented "Improvements in apparatus for measuring gas, and in apparatus for indicating the pressure of gas."

These improvements consist, firstly, in making the front or box in gas-meters in an oval or circular form for the purpose of reducing the labor in the manufacture thereof.

2. In placing the valve in the passage to the outlet in order that the pressure of the gas might tend to raise the valve instead of depressing it as in ordinary meters.

3. In placing the valve at the back of the meter, so that should the meter be tilted, the valve will fall and shut off the gas.

4. In making a communication between the charge-spout and waste-water box with the upper part of the meter, to prevent gas from being fraudulently extracted by drawing off the water.

5. In making the water-line reservoir as small as possible, so that the displacement from the same shall not interfere with the measuring-chamber.

6. An improved mode of showing the water-line by means of an indicator operated upon by the water in the meter.

7. In attaching a spout or syphon to the waste-water box by means of a union or screw, to give greater facility for its removal.

8. In working the finger of the dial in gas pressure indicators by means of a grooved rack or toothed segment attached to a float operated upon or worked by the water in the indicator, and guiding the float by means of a rod fixed to it, the other end of which turns freely upon a hinge joint or other similar means attached to any convenient part of the indicator.

9. In working the dial of pressure indicators or guages by means of an inverted cup floating or immersed in mercury, a rod being attached to the top to actuate the finger of the dial, or by having mercury in an inverted syphon with a rod working the hand or finger of the dial or working over a pulley similar to the action of a barometer hand.

METALLIC WICKS FOR GAS-BURNERS.

Mr. George Davies, of No. 1, Serle street, Lincoln's Inn, London, and 28, Enoch Square, Glasgow, Civil Engineer and Patent Agent, has obtained a patent for "Improvements applicable to nibs or burners for gas."

It is well known that in the combustion of gas for lighting purposes, the flame, which is obtained by means of the ordinary nib or burner, is partially of a bluish tinge, which part of the said flame gives little or no light; and it is to remedy this imperfection that the present invention is designed. The invention consists principally in applying to such nibs or burners metallic wicks of various forms and dimensions, according to circumstances. This system of metallic wicks may be applied to all kinds of nibs or burners, and according to the form of the nib or burner; and the pressure of the gas will give an increase of from 20 to 50 per cent. of illuminating power.

The wicks can be made of any metal, or of any other material that will resist the heat, and may be cylindrical, conical, spherical, hollow, solid, flat, or of other form, or they may be made of one or more wires twisted or interwoven, or of thin plate, perforated or otherwise, according to the form of nib or burner employed.

The object of these wicks is to guide the gas in any required direction and to divide, enlarge and expand the flame; at the same time, the wick, being elevated to a high temperature elevates that of the gas also, causing it to mix more intimately with the air, rendering its combustion more easy, quicker and more perfect, and consequently the flame is more intense, and possesses greater illuminating power.

Another improvement consists in forming a nib, with one or more holes placed obliquely, and so arranging the wick that the gas shall impinge against its surface, and produce a large flat flame similar to the batwing burner.

The claims are for:

1. The application of wicks to all kinds of gas-burners for the purposes above described, whatever may be the material, form, dimension, or composition of the said wicks.

2 The particular construction of gas-burner shown in the drawings and above described.

NEW LONDON, CT.—Works built by S. S. Battin & Co., and are reported to be quite satisfactory. Use Campbell's iron retorts and Down's meters; Newcastle coal principally, sometimes mixing ten per cent. of cannel with it. Newcastle costs $7 a ton. About 3½ million cubic feet were made in 1859. Length of mains about 4½ miles of 3 to 10-inch bore.

NORWALK, CT.—This is one of Chapin, Treadwell & Co.'s gas-works, and has done well. The iron retorts were made at Brick's; the meters are from Down's; the coal is the South Pelton and Cannel mixed in the proportion 85 to 15, at $7 30 per gross ton. About two million cubic feet of gas were made in 1859 Use no photometer. Every company should use one, large or small. It is just as important for a gas company to know what quality of gas it is selling, as for a tailor to charge according to the quality of his cloth; and consumers should insist upon it.

NEW HAVEN, CT.—This is still another of Battin's, or Battin, Dungan & Co., as the firm was. It has been brought rather prominently before our readers by the movement recently made in New Haven to establish an opposition company. Clay retorts are being tried as a substitute for iron, and will undoubtedly be adopted. Meters are of Code, Hopper & Gratz's and Down's make Use Cannel and Newcastle coal; length of mains exceed 21 miles, three to ten inches. Charge no rent for meters.

NEWPORT, R. I.—This is another of J. Lockwood & Co.'s works, and they are well built. They use Elliman's Belgian retorts, with a few iron ones; Down's, Glover's and Gratz's meters, and Pictou and Newcastle coals at $4 75 and $6 25 per gross ton. They made over six million cubic feet of gas in 1859. This Company owes nothing, and its stock rules high for a rural city.

MOUNT HOLLY, N. J.—These are rosin gas works; were built by J. N. Bird, of Trenton, N. J., and are well spoken of. They use iron retorts; Code, Hopper & Co.'s, Harris's and Down's meters, which consumers furnish for themselves. They have 2½ miles mains from two to six inches diameter, joined with lead.

ODDENSBURGH, N. Y.—Works built by Lee & Ray, who received the entire capital stock—$75,000—in payment. Have lately replaced the iron retorts by Elliman's clay, and use Mineral Ridge coal, costing from $7 40 in 1855, down to $5 20, in 1859, per 2,000 lbs. The works have required thorough repairs.

THE AMERICAN GAS-LIGHT JOURNAL is published on the 1st and 15th of every month, and is specially devoted to

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE.

Its purpose is to ascertain and make known all new discoveries in the science and economical application of LIGHT, and promote thereby the interests of companies and consumers; to encourage and aid the introduction of PURE WATER from Lakes and Rivers into Towns and Cities and to improve the system of SEWERAGE, VENTILATION, and DRAINAGE everywhere.

Incidentally with these results, the business of all Gas and Steam Fitters and Plumbers; the erection of Gas-Works and Water-Works; the consumption of Coals, the manufacture and consumption of Coal-Oils, the manufacture of Gas-Pipe, Water-Pipe, Steam-Pipe, Gas Fixtures, Gas-Meters, Water-Meters, Retorts of iron and clay, and their varied apparatus; of Drain Pipes, Ventilating, Heating and Dredging Machines will be increased immeasurably.

THERE ARE 20,000 CITIES AND TOWNS IN THE UNITED STATES, CAPABLE OF SUPPORTING GAS-WORKS, WHILE THERE ARE NOT 400 GAS-WORKS IN OPERATION IN THE WHOLE COUNTRY!!!

New works are now springing up, however, every week, and they will continue to increase rapidly hereafter.

Advertisers of Gas and Coal Oil, Water, Steam, Sewerage and Ventilating apparatus, and of Iron and Brass manufactures, &c., will find the AMERICAN GAS-LIGHT JOURNAL the most desirable and efficient medium of any in the United States, going, as it does, direct to the parties interested in those subjects.

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The AMERICAN GAS-LIGHT JOURNAL can be purchased of all the newspaper and periodical dealers in the United States and Canada.

THE
AMERICAN GAS-LIGHT JOURNAL.

ISSUED SEMI-MONTHLY.

WEDNESDAY, AUGUST 15, 1860.

The Scientific Congress at Newport last week was largely attended, and its proceedings were as interesting, valuable and suggestive, as those of any preceding year. Some of our contemporaries have complained of the meagre practical results that seem to have been realized by the reading of papers expressing views which, if novel and important, might have been with more advantage presented to the public in some other way. We do not here discuss the question as to the merit of the papers read. Our space precludes that course. There can, however, be no doubt that in the various domains of scientific inquiry, and in the useful arts related to and dependent on them, the very highest improvements are likely to be secured by frequent personal intercourse between men of learning, research and culture, who entertain conflicting opinions, and regard the same objects from different points of view. Thought is quickened. The boundaries of science are enlarged. Bright and happy suggestions flash out from the darkness of desultory discussion. The germs of new inventions are disclosed. The baneful contracting influences of old prejudices are got rid of. And in proportion as any science progresses, some of the useful arts must feel the healthful reaction, and expand with the animating influences of a new and more vigorous life. The fact that scientific conventions in this country and in Europe are increasing in popularity, frequency and influence, is in our opinion a most encouraging sign of the times.

Probably in no department of domestic industry are the advantages of scientific research more apparent than in the manufacture, purification and distribution of illuminating gas. Magnificent, however, as are the improvements which have been matured during the past half century, we must not ignore the fact that, in some important aspects, the science and the arts connected with this branch of manufacture await further advancement, and are very far from perfection. Simple as is the principle on which the several processes depend, great delicacy, experience and practical skill are indispensable, in order to prevent failure and insure satisfactory results. The defects and advantages of various materials for retorts, the most available methods of purifying, the best prophylactic measures against injury from the products of combustion, the theory of light in connection with illuminating gas, the best appliances for testing the composition and light-giving power of any gaseous compound, the general administration of gas-works, the most approved means of economizing, the conditions on which depends that vast amount of leakage which causes the companies of this country an annual loss of many millions of dollars—these, and many other related questions of great value, need to be much better understood, and will well reward intelligent investigation. At the Congress of Gas Officers shortly to be convened in this city, all these topics will no doubt receive attention; and from the well-known practical character of the promoters of that meeting, we anticipate that no inconsiderable advantages will accrue to the important and rapidly-growing interest they represent.

Messrs. W. H. GILLELAND, HUGH R. BANKS, and J. S. RIGGS are at present in New-York as a deputation from the city council of Charleston, and are making special inquiries relative to the economies and management of gas-works. These gentlemen intend, we understand, to pursue their investigations at Philadelphia and other cities, with a view to collecting such facts and information as may be of service. Since the amalgamation of the two gas companies at Charleston, the price of gas, it is stated, has been increased to $4; and as great dissatisfaction exists on this and other grounds, the authorities are proposing to erect a new gas-works, to be under the control and management of the city government.

The existence of the bi-sulphides of carbon in illuminating gas is being investigated with some spirit in Europe. An interesting paper by DR. HOFFMANN on this subject will be found on our fifty-fourth page. The most pernicious consequences may result from the presence of this troublesome and obstinate intruder in our gas mains. The agitation which is just now disturbing the equanimity of our trans-atlantic cousins on this subject, will not, however, extend to this city, for, as we are assured, no trace of this offensive compound is found in the gas supplied here.

The *Journal de l'Eclairage au gaz*, in commenting on the experiments with water-gas at Philadelphia, describes it as a project long since exploded in France, and adds, that without wishing to prejudge the question, there is no doubt that the advantages of the methods for making gas from water, have never yet been realized, except by the adoption of such expedients for enriching the gas with illuminating elements as would either be inefficient, or so costly as to render the gas dearer than that obtained from coal.

Petroleum wells are still attracting considerable attention. At one of the sessions of the Scientific Association at Newport, Prof. J. S. NEWBERRY read a paper on those of the Mississippi Valley. He presented several specimens of the oil from the Western wells, and stated that these varieties of petroleum are good for lubricating purposes, but are not adapted for use as illuminating agents. We shall be glad to receive from any of our correspondents, samples of this oil, for examination and analysis.

The geological position of the rocks yielding petroleum, is often in the coal measures, and although the chemical processes by which it is produced are little known, it is undoubtedly of vegetable origin. The precise nature of the methods of its generation is enveloped in mystery. M. BAROULER'S experiments, recorded in the *Comptes Rendus* for February 15, 1858, are interesting in themselves, and peculiarly so as throwing light upon some of those hidden processes in the great laboratory of Nature, by which liquid and gaseous hydro-carbons are produced beneath the surface of the earth. By some writers the changes are supposed to be due to fermentation only, while others ascribe them to processes of distillation by heated vapor.

The oil of Pennsylvania, which has lately caused so much excitement, differs in some important respects from ordinary varieties of Petroleum. Its chemical composition appears to be almost entirely identical with that of coal-gas, as will be seen by the analysis which appears in another column, and for which we are indebted to CHARLES ROOME, Esq., the President of the Manhattan Gas-Light Company. This oil is of a brownish-green color, and has a strong bituminous odor. When exposed to the air it does not thicken or skin over, and it can easily be poured from a bottle when cooled to the temperature of 15° below zero. Its density has been variously stated at ·812 to ·882, and though its boiling point is very high, a vapor begins to come over at about 220°. As atmospheric action does not cause this oil to thicken, or grow hard and resinous like mineral pitch or bitumen, the surface of the ground near the springs has no crust or deposit such as is usually found elsewhere in the neighborhood of the Petroleum Springs. Its lubricating and illuminating properties are so great that the large quantity which is at present being pumped from the numerous wells, cannot fail to contribute greatly to develop the resources and to increase the material prosperity of the district in which it has been discovered.

Mineral oils are observed in many places to issue from the earth, and often in considerable abundance. In Persia, on the north-west side of the Caspian sea, near Boku, extensive beds of marl are found separated to such an extent, that when wells are sunk to the depth of about ten yards, large quantities of naphtha and water collect, which are easily evaporated. In some parts of that district, so much combustible gas or vapor rises from the ground, that when set on fire, it continues burning, and even affords heat for economical purposes. A considerable quantity of an impure variety of petroleum is exported from Burmah, in the East Indies. The country consists of a sandy clay, resting on a series of alternate strata of sandstone and shale. Beneath these rests a bed of pale-blue shale, rich in petroleum, which lies immediately on coal. Petroleum springs have also been found in the coal districts of Shropshire and Derbyshire, in England. The sea, near the Cape de Verd Islands, has been often seen covered by a film of rock-oil. The finest specimens, however, are said to be obtained in Italy, where petroleum is found in several places.

The discovery of mineral oil is by no means of modern date, for in various parts of the world, springs of bituminous fluid have been discovered in times very remote from our own. Herodotus, for example, mentions the wells of Zakunthos, the modern island of Zante, from which bitumen is at the present day obtained. Plutarch, in his account of the expedition of Alexander the Great, graphically describes the awe inspired by the spectacle of "a gulf of fire which streamed continually," near Ecbatana, the modern Hamadan. This historian also describes "a flood of inflammable fluid, which issuing from various springs, formed a lake," near the burning gulf, and records the fact that "the inhabitants of the neighborhood exhibited to the king the force and subtilty of its nature by scattering some drops of it in the street leading to his lodgings. Standing at one end, in the darkness of the night, they then applied their torches to some of the first drops, and the street became instantaneously all on fire." Similar facts are recorded by other ancient writers; and it is far from improbable, that the perpetual fires of some of the celebrated pagan shrines of the ancient world had their origin in springs of petroleum, or in jets of inflammable gas, accidentally discovered, and in accordance with the superstitious views of Eastern nations, invested with the attributes, and ascribed to the special presence of some presiding deity.

ANALYSIS OF PETROLEUM.

The following experiments were made in the laboratory of the Manhattan Gas-Light Company, New York, on a quantity of Petroleum from Oil Creek, Penn.

Partial analysis of the gas:

Olefiant Gas, ...	9·00
Hydro-Carbon Vapors, . .	3·75
Carbonic Oxide, ...	1·75

One gallon of oil weighs about 6·75 pounds. One pound of oil produces 14·66 cubic feet of gas—equal to 32,838 feet per ton of 2,240 pounds, 5 cubic feet of gas being equal to 22·84 standard candles. The oil has no fixed boiling point. Its specific gravity is 812, water 1000.

The gas was generated by introducing the oil at the rate of one pound in 45 minutes through a siphon and iron tube fastened to the lid, and reaching back nearly to the end of a small retort partially filled with coke, and heated somewhat above the temperature required for the distillation of coal.

The gas contains a little sulphuretted hydrogen, and must be passed through a lime purifier; which also arrests some finely divided carbon resulting from the decomposition of the oil.

The illuminating power of the gas proved on photometric examination, to be equal to 22·84 candles. 3·88 cubic feet per hour were burned without smoke in a fifteen hole Argand and seven-inch chimney, and the illuminating power was calculated for five cubic feet.

When passed through a freezing mixture, and cooled to 18° Fahr., the gas had an illuminating power of 20·26 candles, showing a depreciation of 2·58 candles.

BUSINESS DEPARTMENT.

Our readers will notice that Muspratt's Chemistry is now completed, and ready for delivery. Messrs. Balliere, Brothers, 449 Broadway, and C. B. Russell, Brothers, 12 Tremont street, Boston, are the agents.

The attention of gas officers and gas companies is again called to Walton's Anti-Freezing Apparatus, illustrated on the first page of this number. If any are so regardless of their interests as to neglect to avail themselves of this simple and cheap appliance, they must be left to the hopeless obscurity of frozen gas mains.

By order of Captain Benham, U. S. Engineers, Chief Engineer of the Washington Aqueduct, we insert the advertisement to Contractors for Water Pipes, to which we call the especial attention of those interested. Our columns will contain from time to time advertisements for proposals of this nature from this Department of the Government.

PROSSER'S GLASS ENAMELLED IRON TUBES.—This admirable substitute for lead pipe is advertised in our columns. They are largely used in England, and must become a formidable rival of the old lead pipe. Samples are on exhibition at these Rooms.

ON THE CHEMISTRY OF COAL DECOMPOSITION IN HEATED RETORTS.

[*Continued from* p. 254, Vol. 1, *of the* AMERICAN GAS-LIGHT JOURNAL.]

In the June number of this JOURNAL, the deductions from a large number of experimental trials on coal decomposition, were briefly stated, as forming the basis for more extended inquiries on this point, and for suggestions in relation to forms of decomposing apparatus or retorts, adapted to constant use.

It was stated—"If a retort of a certain form, produces more and better gas than a retort of another form, the effect must be owing to a diminution in the quantity of condensible fluid products, the amount of coke remaining the same always." This remark in regard to the amount of coke, applies correctly to the usual mode of conducting the operations in vessels or retorts, which permit the *decomposing* and *distilling* of coal to proceed during the working of a charge. It is one of the direct results of a better mode of decomposition, that the *weight* of the coke is increased by the carbon of the usual volatile heavy products being retained in the retort. But it is also remarkable, that the *quality* of the coke from most of the kinds of coal used in gas-making, is improved. Its appearance is unlike that ordinarily produced, as the heavy vapors do not seem to form an atmosphere in the retort; but the constituents which generally produce them, suffer decomposition at or near the surface of the coal as deposited in the retort, and the porosity of the coke is diminished, while the brilliant lustre of allotropic carbon formed, gives a metallic aspect to the mass.

There is a manufacture from coal now most extensively established, which illustrates on a grand scale the better mode of decomposing coal which has been here presented. In coking raw coal, for metallurgical processes, various forms of apparatus have been used in some of which the tar and even gaseous products are saved, and an approximation to the gas manufacture made; with the necessary deterioration of the coke, classing all the different coking ovens and methods, it will be seen that as the heavier products are allowed to form, both the quantity and the quality of the coke suffer. In contrast with the well known plans, is the later simple, but highly valuable improvement invented by Ebenezer Rogers, C. E., of Abercarn, South Wales. In this, the mass of coal inclosed by parallel walls about fifteen feet apart, with end walls erected after the coal is placed, is disposed on a covering of fine coal about nine inches thick. The coarse coal is laid with open passages across, to serve as flues, and then connect with flues in the fire-brick walls, about three feet apart, about five by eight inches square: the mass at one foot from the surface of the earth, has then passages about three feet apart and about sixteen inches high. Over these the coal is piled even and the covering is small coal or coke, about nine inches thick, laid even with the inclosing walls, which are five to seven feet high. Each flue, near its bottom, has an opening to the external air for convenience in placing ignited coals, for commencing the inflammation, and which is then closed, so that the products of combustion find their way out by the flues, which purposely terminate level with the inclosing walls. The covering is the small coke left of a previous operation, and admits the air in that small proportion necessary to burn the gaseous matter alone.

If we consider this charge of coal, which may weigh three hundred tons, as a number of rectangular cylinders resting horizontally, each becomes inflamed along its sides, and the gaseous matter evolved is formed at the point where the temperature is just sufficient to produce it. Its combustion gives rise to more heat and the coal of the cylinder is coked step by step as the operation proceeds. The heat in the flues is intense, and the draft of supplying air is consequently drawn down through the finer particles forming the covering, in the measured portions required. An attendant checks the draft of any flue when it becomes too rapid, and keeps the covering layer even and close, until, the *gaseous* combustion over, the flues can be closed and the coke cooled. When the end wall is removed a compact mass of prisms of brilliant solid coke, extending to the ground, is presented, the covering alone remaining unchanged in part.

While the mass is undergoing this slow combustion, it does not appear as an ordinary coking process, but a kind of rapid fermentation, unattended by smoke, seems to be going on, and excepting in the highly heated flues, there is no visible combustion or ignition. The coke thus formed is many per cents more in weight, far more compact and brilliant than any formed from the same kind of coal by the oven or kiln process. The materials which would form tar and smoke, are by the modified circumstances of the new method, resolved into nearly pure gases and carbon.

It is to this point of modified result, brought about by a varied method, that I would direct the attention of the intelligent gas engineer, for it is probable that he has been taught under a system of coal distillation and decomposition, that coal tar is an essential product of the gas manufacture, as dense vapors and smoky furnaces, were deemed necessary attendants of coking operations, before Mr. Rogers devised his truly practical plan, of preventing their formation.

Illustrations might be drawn from other sources, of the control which the operator has over the formation of products from coal, but in this JOURNAL which is read by those who are every day observing the production of gas with little fluid matter, and by those who are oppositely striving to obtain the largest amount of fluids, and step by step reducing the proportion of gaseous matter produced, it may be deemed superfluous to dwell on the point.

It may be considered as experimentally demonstrated, that coal, and especially mixed coals, in the apparatus for gas, can be converted into gaseous matter, without the production of tar, or any fluid heavier than water.

Some suggestions in relation to methods having this object in view, will be offered in a future article.

PLATINUM.

THE WATER-GAS.

A BRILLIANT LIGHT AT THE GIRARD HOUSE.

Yesterday evening a number of gentlemen assembled at the Girard House for the purpose of seeing the effect of water gas, with which a portion of that famed hotel is now lighted, the gasometer and works having been erected in a very convenient form on the premises. The furnaces and machinery, indeed, are quite curious, and as being in this instance the very fountain of light, from which a very brilliant, pure and intense illuminating power is eliminated, we naturally mention them as very successful specimens of skill and science, forming an *ensemble* of productive effulgence that is alike creditable to the inventor and the manufacturer.

But what are the results? We reply that they fully equal, if they do not even surpass, the reasonable though sanguine expectations of the "Keystone Gas Company"—such being the title of the association under whose auspices the water gas has been introduced in this city. Our readers ought to be informed that this gas is generated from water and rosin, and as the vapor produced by these passes over a bed of burning charcoal, a portion of the carbon is taken up. Forty pounds of rosin are used to every thousand feet of gas, the quantity of charcoal being very small. Then the company, when they first lighted up their burners, might have been supposed to have said, (we mean no irreverence,) *fiat lux, et lux fuit!* Of seven sections for lighting the Girard House, five are now supplied with the water gas. In fact, there were three hundred burners in full action last night, and we had an ample opportunity of observing its effect, both within the glass globes of chandeliers, and with the flame exposed to the open air.

These lights were commenced three weeks ago. Some days elapsed before the tar produced by the coal gas was cleared out of the pipes; and now we have this wondrous discovery, the water gas, in all its glory, diffusing light and cheerfulness everywhere around.

Its influence extends far and wide, for the brightness is of a white, clear, pure, and penetrating character, before which even distant darkness flies away. One great advantage, too, is its cheapness, the price being much less than that of the gas made from bituminous coal. Dr. Sanders is both the inventor and the patentee, and the economy incident to his process is derivable:

1. From the superior productive power of retorts used in the manufacture of Sanders' gas. The aggregate cubical capacity of the three retorts erected at the Girard House is but two-thirds of the cubical capacity of one ordinary coal-gas retort. The usual product of a coal gas retort is less than 200 feet per hour; the water-gas retorts yield with ease 800 feet per hour, indicating in favor of Sanders' process a facility of production five-fold as great as from coal by the usual method.

2. From the decreased proportion of *labor*. One man can manage more than twice as many retorts making Sanders' gas as he can those producing gas from coal.

3. From the decreased *capital* required in original construction, and *interest* thereon accruing.

4. From the decreased cost of gas *material*. The coal gas in common use is a mixture of various gases and vapors of different qualities, ninety per cent. of which produces no light directly, but the presence of which is necessary to maintain the other ten per cent. in a light-giving condition. Instead of destroying costly coal to obtain this large proportion of non illuminating material, Sanders' process finds the elements it needs in inoffensive charcoal and water, deriving its quality of illumination from any form of hydro-carbonaceous matter, such as rosin, tar, or cannel coal. In the manufacture of illuminating gas from rosin, a pound of that material usually leads from 6 to 7 feet; in Sanders' process but a pound is used in 30 to 40 feet.

Favorably as the cost of Sanders' gas contrasts with the cost of coal-gas in this city, where gas-coal is cheap and abundant, its economy rises into still more impressive proportions in localities destitute of gas-coal and defective in means of transportation. Many parts of this country, and much of Europe, are thus restricted, and consequently taxed excessively for artificial light.

A reduction of three-fifths in cost of material, transportation and labor, will doubtless secure its introduction to many regions now but partially supplied with this great agent of social progress, enlightenment and comfort.

At the Girard House, the confined space allotted to the gasometer limits the supply of water-gas to the house to about three hours' demand, compelling the establishment to depend upon the city for gas, in the event of repairs to the private works being needed. The city gasometers are so large, that an entire stoppage for several days of manufacture at the city works would be unknown to the citizens.

While we were writing this paragraph, the bar-room was lighted up, there being several handsome chandeliers in full blaze, and the effect was certainly gorgeous and dazzling. The Directors are, Messrs. Henry C. Carey, President; Abraham Hart, Marmaduke Moore, and James G. Clark. We congratulate these gentlemen on the success which has crowned their bold efforts and public spirit, and we cordially wish them such appreciation and remuneration as their enterprise so amply merits.—*Phil. N. American, July* 31.

MORE GAS-WORKS UNDER WAY.—Messrs. Dimmock, Dwight and Co. have finished the works at Greenfield, Mass., lighting up in latter part of last month with nearly 100 consumers, having been just seventy-three days in building it. Capital, $23,000. Population of gas district, about 4000. Number of consumers, 120. Street lamps, none. Brick's 9 feet clay retorts, Springfield pattern. Cement joints. Leakage and condensation, 240 feet per day. They also broke ground at Westfield, Mass., early in August, for a gas-works; plant same size as Greenfield, and expect to light up October 1st.

CALIFORNIA GAS COMPANY.—We would like to know something of an institution said to be incorporated by Messrs. J. P. Lord, N. Rowley, and W. G. Southard as Trustees, with Edward G. Tuckerman as Secretary, and bearing the above title, with a nominal capital of $500,000. We will thank any one who knows about this company to tell us what and where it is.

CIRCLEVILLE, O.—Gas works have been erected at this little town by W. W. Bierce, Esq., as already noticed in the JOURNAL. The Town Council passed the ordinance Sept. 20, 1859; it was accepted by Mr. Bierce Sept. 27; ground was broken early in October, and Circleville was lighted with 26 public lamps and two miles street mains, January 12, 1860. During a part of the interval the thermometer indicated 20° below zero. There are now nearly three miles street mains laid, 140 private meters set, and 40 public lamps will be in operation in November. In July 123,000 cubic feet gas were made. R. T. Coverdale was the Engineer, and, as our correspondent says, "a man who ought to be better known to the public." George Stacey of Cincinnati made the wrought-iron work, tank, roof &c. These works are emphatically the child of the AMERICAN GAS-LIGHT JOURNAL, as will be seen by the letter from Ohio in the number for August 1, 1859, page 2, Vol. 1.

REPORTS OF WATER COMPANIES.

QUEBEC, C. E., WATER WORKS.

We are indebted to W. Shordiche, Esq., Manager Q. W. W., for the City Treasurer's accounts, and other documents of the Corporation of Quebec, from which we abstract the Report of the Water Works.

The Water Works Department was unable this year to cause such extensive works to be executed, as in former years; firstly, because they were not found necessary, owing to the distribution of the water in many parts of the various wards of the city; and secondly, in consequence of the too limited means at its disposal. Nevertheless, it has been enabled to cause several useful works to be executed, some of which will contribute to the health of the city, and others to increase the revenue of the Department, as shown in the following statement:

Length of pipes laid down for pure water	4,904	feet.
" " for drainage	1,295	"
" of Sewers built in brick	210	"
" " in wood	160	"
" of Pipes to discharge the Hydrants	18	"
Number of Stop cock wells	4	"
" Stop-cocks put down	7	"
" Hydrants	2	"
" Man holes made	4	"
" Gully wells	1	"
" Service pipes	54	"
Average number of men employed	29	"

The works executed for the Aqueduct, and drainage to the present time, are as follows:

Total length water pipes	144,787	feet.
" Clay pipes for drainage	75,451	"
" Sewer built in brick	20,670	"
" " " wood	600	"
" Iron pipes for hydrants	2,339	"
" City pipes for do.	2,015	"
Number of Stop cocks	84	"
" Hydrants	168	"
" Junction wells	85	"
" Man holes	155	"
" Gully wells	157	"
" Buildings provided with water	3,000	

Notwithstanding that an 18-inch pipe was laid down in Salaberry street and a part of the Grand Allée, it was found impossible to supply the most elevated parts of the city with water at all times, more especially during the very cold days of autumn and winter. The Water Works Committee has, in consequence, with the approbation of the Council, entered into an agreement with Mr. John Lee, late an officer of the Department, by which that gentleman binds himself to furnish a constant supply of water to all parts of the city, by means of the existing pipes and a certain apparatus placed at the Chateau d'Eau, for the annual consideration of $2,000. during seven years; and the payment of a further sum of $2,000, to cover preparatory expenses. He is to receive nothing should he be unsuccessful. I cannot yet inform the Council of the success of the undertaking, as the experiment is to be tried in a few days.

ANNUAL STATEMENT OF THE WATER WORKS DEPARTMENT TO THE 31ST DECEMBER, 1859.

DR.

Dec. 31, 1859.—To Quebec Water Works, works completed	926,325	29
" Lands Purchased Real Estate	41,432	97
" Workshop at Palais, machinery and tools	6,452	60
" Police Committee, attendance at fires	195	49
" Bricks on hand	756	52
" Palais Wharf, cement and clay pipes on hand and deposited there	1,678	77
" Mrs. McDonald, due by her for mill rent	1,257	50
" Stock account, stock on hand	117,590	26
" Drainage account, due by Road Department	51,393	62
" Cash account on hand	3,492	98
" Sundry contractors, paid them on account	760	19
	$1,151,337	59

CR.

Dec. 31, 1859.—By W. & D. Bell, due them	397	96
" Debentures (bonds issued)	1,102,850	00
" H. O'Donnell, due him for salary	1,200	00
" A. Joseph, advanced by him to open Des Glaces street	177	17
" Aug. Gauthier, C. T., due him	766	91
" Bills payable	12,710	81
" Quebec Bank, notes unredeemed in their hands	33,000	00
" Sundries due them for labor and materials delivered	304	74
	$1 151,337	59

WATER WORKS OFFICE,
CITY HALL, QUEBEC, Dec. 31, 1859.

E. J. GAGNON, *Accountant.* W. SHORDICHE, *Manager, Q. W. W.*

PARAFFINE.

BY BARON REICHENBACH.

From the "Journal für praktische Chimie" Oct. 1854, and the "Philosophical Magazine," Dec. 1854.

Nearly a quarter of a century has now elapsed since I exhibited the first specimen of paraffine to the German Association of Naturalists at Hamburg in 1830, and described the mode of preparing this substance in Schweigger's Journal of Chemistry. With the exception of some analyses by Ettling, Lewy, and others, very little has been communicated regarding this body since that period. The very valuable properties of paraffine, the power with which it resists the action of concentrated acids and alkalies, and even of potassium at a boiling temperature, the brilliant whiteness of its flame, which deposits no soot, its beautiful translucency and its lubricating quality, recommend this substance for various technical applications; and I have myself called attention to this fact from its first discovery, without being able, however, to arrive at any satisfactory results in its industrial application. The difficulty which presented itself, was the small quantity which the dry distillation of wood furnishes of this substance. I subsequently showed that paraffine might be obtained from vegetable oils, from animal substances, and likewise from pit-coal; but from all these substances so minute a quantity was obtained that its production for manufacturing purposes was neither remunerative nor inviting. Thus paraffine remained up to this period an interesting curiosity, unknown except in the collection of scientific chemists.

I now hear that in England, which is essentially the country of useful applications, a manufactory of paraffine upon an extended scale has been carried on by Mr. Young since 1850. This talented chemist has succeeded in finding a method which yields comparatively large quantities of paraffine. Mr. Young obtains 13 lbs. from a ton of cannel coal. This discovery renders the preparation of paraffine a lucrative branch of industry, especially since, in addition to the production of paraffine, a large quantity, about 30 gallons, of a lubricating oil is obtained which is saturated with paraffine, and which is said to surpass all other fatty substances as an antifrictional, and to have been already so generally adopted, that Young's works now supply as much as 8000 gallons to the market. The most evident proof of the advantages offered by paraffine, is the rivalry which has already ensued in its production, and is well illustrated by an action at law, which some of the later competitors of Mr. Young have brought against him with the view of upsetting his patents, by attempting to prove that the discovery was not new, and was in fact not capable of being patented. It is true that the discovery of paraffine is my own, and I have announced it. To Mr. Young, however, belongs the merit of a second discovery, the merit of having elaborated a method which furnishes a comparatively *large* quantity of this substance, and which is sufficiently remunerative to the manufacturer; a result which I had vainly endeavored to realize. I hope that Mr. Young will succeed in convincing the legal authorities of the priority of his practical discovery, which was not part of any purely scientific investigation, and which I cannot claim in any way. May he enjoy the fruits of his invention and of his industry, which he deserves, and to which no other person has a right!

For the AMERICAN GAS LIGHT JOURNAL.

THE COAL-OIL MAN.

If aldermen, steamboat captains, Japanese Tommy and the three-cent man are people of sufficient importance to introduce to the public, surely the Coal-Oil Man, who is very often the embodiment of all the learned and useful professions, may claim a place before the public eye. Formerly the Coal-oil Man was merely a chemist and man of science, but lately he has undergone a change, and he is now a lawyer, doctor, druggist, wholesale and retail, sea captain, steamship owner, preacher, broker, pugilist, actor, sexton, and undertaker generally. His enterprise is unbounded, time and distance and the money invested in his inventions not being considered when he has once sighted the cause of his mania—cannel coal. He is found everywhere; the unpleasant smell which accompanies many of his operations, will greet the nostrils as plainly in the wild Virginian or Pennsylvanian forest as in the narrow lanes of a manufacturing suburb. The very sight of coal, let it be even *splint* or *semi-cannel*, will cause him to exhibit signs of high excitement; his eyes grow bright and his tongue grows eloquent, and he pours forth a torrent of words concerning its *yield*; how much *crude* oil or *refined* from the ton, and cost of making it, which is generally not more than twenty cents per gallon, best refined, in barrels (iron hoops and oak staves) delivered in New York. The Coal-oil Man regards not patents nor the labors of other people. He believes himself to be the exact centre of all the art and mystery of his peculiar calling; his process is the only one which will take out the *color* and remove the *odor*; and he can make all of his crude oil into lamp oil, which will burn twice as long as any other oil, and will not *crust the wick*. His machinery partakes of his own restless character. His *retorts* stand up, lie down, turn around, and have in many cases walked away with a full load, consisting of all the money which had been expended on them, to the astonishment of their owners. His chemical manipulations effect changes which startle the mind; he can produce more oil (by his peculiar, newly-invented mode) from one ton of coal than would seem possible, seeing that the bulk of oil is twice that of the raw material. He can refine oil from the *crude* at a cost of 1-10th of one cent per gallon, wear and tear and interest on outlay included. His age is between sixteen and one hundred; he looks much older than he is, the strong acids over which he stands wrinkling his face and hands. He dresses in a variety of costumes—sometimes like a man about town, but generally in the garb of a Methodist minister, whose congregation is small, and not inclined to pay in cash. He talks well upon any subject connected with his business, and is a great favorite with the ladies, who declare that the smell of coal-oil is delightful when toned down by age. His handkerchief has holes in it. He has a spot upon the end of his nose, caused by smelling acids and alkalies. Altogether he is a good specimen of the hard-working, inventive and enterprising American, whose labors will yet be appreciated by the world at large, when his peculiarities will be lost sight of in the brilliancy of the safe and beautiful light which he is introducing to the homes of the people.

FORTY-TWO-AND-A-HALF BAUMÉ.

BRECKINRIDGE CANNEL COAL.

BY PROFESSOR B. SILLIMAN, JR.

The coal measures in Breckinridge county reach an elevation of 500 ft. above mean high-water of the Ohio river, at Cloverport. The strata lie with remarkable uniformity, and nearly horizontal, their dip being south-west, at the rate of about four inches in one hundred feet, or less than twenty feet in a mile. The surface of the country is deeply cut down by the wear and tear of the watercourses, and of atmospheric agencies. The bluffs on the Ohio, at Cloverport, as elsewhere in that region, are composed of a fine-grained granular sandstone, loosely aggregated, thickly bedded, of a light gray color, nearly free from anything but silica, and easily reduced to a sharp, clean white sand. No traces of organic remains could be found in it; but, from its position, it must be below the coal. It will be observed that *three* coal-seams are shown. The two lower are common bituminous coal, and need not be particularly mentioned in this connection, except to say that the lower bed (from four to five feet in thickness) is believed to be the same which is worked at Hawsville. The coal which now occupies our attention is the uppermost member of the series, occurring at an elevation of nearly three hundred feet above the level of the Ohio, and capped by a thick overlying mass of sandstone and shales. This bed of cannel coal is about three feet in thickness, with a bituminous shale of some ten feet in addition, on which it immediately rests. As a consequence of its position, it covers a less area of country than the lower beds, having been removed in many places by denuding causes. It is to be looked for in the regions where I have seen it—in the uplands and hill-tops, and only there, where the general level of the country reaches a certain elevation.

The northern margin of the coal beds in the place referred to, lies about nine miles from the Ohio river, to which point a railway has been built. Here a marked change in the topography of the country is visible. The hills become more sweeping, and the valleys less precipitous, while the contour lines wind in graceful and gentle curves around the base of the hills. The upper members of the series at this point furnish a soil of enduring strength, as is tested by the size and abundance of the forest trees. Numerous small rivulets, the head-waters of Clover Creek, afford ample drainage.

The Cannel Coal of Breckinridge County is characterized by the following peculiarities, viz.:

1. *Its density*, which is 1·14 to 1·16. Common bituminous coal varies from 1·27 to 1·35, and the anthracite from 1·50 to 1·85. The only coal lighter than this, so far as is known, is the so-called "Albert Coal,"* of New Brunswick, whose density is 1·13. The cause of this low density will be sought, chiefly in the very large amount of volatile matter.

2. *Its Tenacity and Elasticity.*—Coals are usually brittle and inelastic. This is tough, and resists powerful and repeated blows, and rebounds the hammer like wood. The splints of this coal may be sensibly bent by pressure, and regain their original form again. A fissure in it may be sprung open by a wedge, and will close again on withdrawing it. The writer has never seen any other coal with this peculiarity.

3. *Its Electrical Power.*—The Breckinridge coal becomes powerfully excited by friction, with resinous electricity. This peculiarity may be demonstrated very easily, and has never been before noticed in any other coal, so far as the writer has been able to learn, except in the "Albert coal" of New Brunswick, before named. It is not easy to understand why other very highly bituminous coals should not have this property, but such is the fact with a large number that have been tried.

4. *Its Chemical Constitution.*—This has been determined in the usual way, by destructive distillation, with the following results, viz.: in 100 parts we have,

	I.	II.
Volatile at redness,	60·27	63·520
Fixed Carbon,	31·05	27·160
Ash,	8·66	8·470
Hygroscopic moisture,		·777
Sulphur	a trace	a trace
	99·98	99·927
Coke,	49·71	36·68

A comparison of these analyses with those of other highly bituminous coals, will show that there are very few examples recorded of so high an amount of volatile matter. For example, we find among American coals that the "Albert Coal" of New Brunswick, yields 61·74; the coal of Chippenville, Penn., 49·80; that of Kanawha, 41·85; that of Pittsburg, 32·95 per cent.; while the mean of the fat, caking coals of Liverpool is 37·60 per cent. The Lowmoor Scotch Cannel, and the Boghead, also a Scotch coal, are the only ones giving a higher proportion of volatile matter. In fact, the ordinary proportions of volatile and fixed ingredients in bituminous coals are completely reversed in the Breckinridge Cannel.

* Asphaltum. See Taylor's deposition before the Supreme Court, Halifax, on the Hillsboro' Asphaltum Mine, Albert Co., N. B., and other competent authority.

MISCELLANEOUS ITEMS.

THE POTOMAC WATER WORKS.—Capt. H. W. Benham, Chief-Engineer of the Potomac Aqueduct, arrived at Washington, D. C., lately, to take measures for the vigorous prosecution of the work to completion. Some of the newspapers hold out the idea that the order of the Secretary of War, dated 17th July, published in the last number of the AMERICAN GAS LIGHT JOURNAL giving directions for the completion of the work will lead to "an official war." On the contrary, says the Baltimore *Sun*, the directions seem to be intended to prevent "an official war"—to prevent war between executive officers, and between Congress and the Executive, and will certainly have that effect. The Superintendent, Captain Meigs, will be enabled, under these orders, to accomplish his laudable desire to finish the work according to his own plan and estimates, and every facility is given him for this purpose. Any embarrassment which may have heretofore arisen from disagreement between the Superintendent and the Secretary of War, is removed. Between Captain Meigs and Captain Benham the most friendly relations exist, and there can be no "official war" between them individually, or between them jointly and the War Department. It may be apprehended, as has been stated in Northern papers, that the Potomac Aqueduct can not be completed within the estimate—half a million. But that is of much less consequence than the prompt and proper execution of the work. But the water from the Potomac will be obtained and brought through the city for an amount within that sum—though it is said that there will not be enough left to complete the great reservoir. The Cabin John Creek bridge, over which the water is to be brought from the Potomac, is now to be completed, and will be one of the greatest triumphs of architecture and engineering skill anywhere found in the world. This magnificent work will be quite hidden from public view by the difficulty of access to it. An appropriation will, therefore, it is hoped, be made for the construction of a good carriage road to the bridge, and, when this shall be done, Washington may boast of a drive equal, in respect to beautiful and romantic scenery, to any in the country.

LIGHTHOUSES ILLUMINATED BY ELECTRICITY.—Professor Faraday, of London, in the *Philosophical Magazine*, of April, expresses a favorable opinion of the electric spark for lighthouse purposes, and states that the experiments last winter, in the South Foreland high light has proved successful. Prof. Holmes's two magno electric machines were adopted, being each worked by a steam-engine of two horse power. The lamp has a delicate and ingenious contrivance for so adjusting the two carbons between which the electric light shines that, while they gradually change their bulk, the relative position of their points shall be the same, and the place of the light be preserved constant and unchanged. The spark in this apparatus is not obtained from frictional electricity, or from voltaic electricity, but from magtetic action, nothing more being required to produce the electricity than to turn an axle, on which are fixed wheels having magnets arranged around their circumference, and which revolve in close proximity to helices or electric coils. In these, various electric currents are thus produced, which are collected and sent up through two insulated wires into the lighthouse lantern.

These electric wires end in the two bars of the small railway on which the lamp stands. When the two carbons of the lamp are nearly exhausted the lamp is lifted off and another instantly pushed into its place. The whole consumption of material to produce the light is the coke, and water required to raise steam for the engines, and carbon points for the lamp in the lantern. The first spark of magnetic electricity to which the discovery of this new science is due, was obtained twenty-eight years ago.

During six months this apparatus has done its duty well. The light has never gone out through any deficiency in the engine or machine-house, and when from any other cause it may have become extinguished, a single touch of the keeper's hand has caused it instantaneously to resume its brightness. The illuminating brilliance shed forth as it shone up and down the channel far surpassed that of any other fixed light. Among the points to be considered before the electric light can be generally adopted, are, the expense, which is great and the variations or occasional interruptions of the light from causes imperfectly known, and therefore imperfectly controllable.

SULPHUR IN COAL GAS.—The gas usually burned in most of the large cities in this country and in Europe is now much more pure than formerly. Many injurious compounds which are mixed with the gas at the moment of its generation are, by appropriate chemical processes, removed before it is allowed to enter the mains for public consumption. Notwithstanding the best means of purification known, however, a minute quantity of a sulphur compound often remains, which yields sulphurous acid when the gas is burned. A recent number of the quarterly journal of the London Chemical society contains an account of some experiments which prove that from 100 cubic feet of London gas, 7½ grains af sulphur are yielded in summer and ten grains in winter. In cases where the sulphuretted hydrogen has not been carefully got rid of, by chemical reagents, the proportion of sulphur would of course be much greater, and its mischievous effects on the human economy and on pictures, gilding and ornamental furniture would be seriously increased. The attention of the public having been awakened to this subject, some new and appropriate methods of eliminating the minute quantity of the deleterious sulphur compounds will no doubt be contrived.

GAS-LIGHTING AT THE ANTIPODES.—The proprietors of the *New Zealander* newspaper, published in Auckland, have created quite a sensation in that interesting colony, by the introduction of the National Coal-Gas Apparatus, invented by Mr. George Bower, St. Neots, and manufactured by Messrs. J. T. B. Porter & Co., of Lincoln, England. The coal used is from the newly discovered Downy coal fields, which has been found to be well adapted to gas-making, and there is every probability that the entire city of Auckland will soon be lighted with gas made from it. The Lincoln (Eng.) *Times* offices have long been lighted with one of the same works, which have had an enormous sale in England and Scotland.

It is said to give a very superior yield in gas, and to make a fine coke. The owners have already begun mining operations, and expect to commence making shipments of the mineral by July next.

MUCK AND GAS-WASTE AS MANURE.—A correspondent of the *Homestead* formed a compost last winter of two parts peat or muck, and one part gas-waste or lime, composing them well together, turning and mixing three times. A heavy dressing was applied to a piece of carrot ground, otherwise well manured; a good crop was the result. But how much was due to the compost it is impossible to determine. "Four rows through the centre of the cornfield were manured with a large shovelful of the gas compost in the hill, and no other manure used. The result was four rows of cornstalks from a foot to two feet high, and not a single sound ear of corn." It was used on tobacco and on onions, with a like injurious effect upon the crops. Probably the gas waste was used too freely, without a longer exposure to the air than was allowed.

GAS EXPLOSION.—On Friday evening last, at about half past eight o'clock, the inhabitants in the neighborhood of Tupper and Elm streets were startled by a loud explosion. It was found to proceed from the building occupied as a store and dwelling, on the corner of Elm and Tupper streets, and was caused by the explosion of escaped gas. The force of the explosion shattered the glass in the windows, and pretty well scorched every thing scorchable in the house.

GAS FOR COOKING AND HEATING PURPOSES.—The *Cincinnati, O., Gazette* says: At present about one hundred families are cooking with the different kinds of Gas Stoves—each family averaging five persons, making five hundred persons. It takes about ten cubic feet of gas per day to cook for each person, making a daily consumption of five thousand feet, and yearly, one million eight hundred thousand feet of gas. Part of those families do not do all their cooking by this process in the winter, but the increased consumption in eating houses and for heating purposes will maintain it to that amount. The price of gas in Cincinnati is $2 50 per thousand feet; making the daily income to the Gas Company $125, and annually, the sum of $4,500, with an increasing consumption.

SPLITTING RAILS BY GAS LIGHT.—The *Rochester, N. Y. American* says: The fence around the White House at Washington being broken down, or so far dilapidated that the hungry hordes of politicians, seeking after the spoils, find it an easy matter to gain access to the valuable treasures contained in the public crib, "Honest Old Abe," and a few Republicans, have thought it judicious to turn out after a hard day's work and split a few rails and repair the fence, so that the public treasury will remain secure. Several hundred were split out at the City Hall on Thursday evening, and will be transmitted to Washington, ready to secure the White House from further invasion after 4th March, 1861.

IGNITION OF GAS ON THE FULTON FERRY, N. Y.—The boats of the Union Ferry Company are lighted with gas, conducted in pipes from the Brooklyn Gas Works to the different landings. A few weeks ago, one of the workmen, while in the act of supplying a boat with gas took a lighted candle to see if he had let on a sufficient quantity, when it ignited instantly and blazed up at a fearful rate. The engine on the boat was promptly set to work, but water proved of no avail, when some one present ran to the pipe and turned off the supply of gas. They must have a rich set of hands at the ferry. One takes a light to "see" the gas, and another plays the water upon it to put it out!

RATS VS. LEAD PIPES.—A letter from Liverpool, England, says: "We consider refuse lime, obtained from the purifiers of gas works, when laid under the pavement, a preventive to rats, as they will not burrow in or near it. We are obliged in our offices here to put a convenient place near the cistern for the rats to get water at, or they eat our lead pipes through without fail; we have had several so eaten. I have one piece of 1¼ inch pipe, with a hole in it 2½ to 3 inches long, and ½ to ¾ an inch wide, the edges of which show well by what means it came there, having marks of teeth all around; it has caused us great damage to the ceilings by the water."—*Scientific American*.

COTTON SEED OIL.—A company has been chartered by the Legislature of Tennessee for the extraction of the oil from cotton seed. They will soon commence the erection of a factory at Memphis, with a capacity of extracting five hundred gallons per day. A few years ago the seed of the cotton, which now yields, under proper treatment, a valuable oil, of considerable commercial importance, was one of the troublesome surplusages of the southern plantations.

THE GREAT WESTERN AIR-SHIP.—Preparations are said to be going rapidly on for the departure of Professor Lowe on an aerial expedition across the Atlantic. Subscriptions are being received by Professor Cresson and William Hamilton, of the Franklin Institute and Lorin Blodget, Esq., Secretary of the Board of Trade, Philadelphia, for the purpose of equipping the air-ship with instruments for inflation, and other incidental expenses. It seems to Mr. Lowe after the success of the trial trip made a short time ago, that there is nothing to hinder the attempt from being made, and whether fully successful or not, it must add something to the general stock of scientific knowledge; and with the splendid life boat and many other skillful appliances, it seems that there can be no danger, even if they should descend into the ocean. Professor Lowe states that he will take letters for all parts of Europe, and is fully confident that he can deliver them safely in forty-eight hours. The crew of the Great Western is to consist of four persons, viz.: Professor Lowe and two scientific associates, and an experienced sea-captain, to take charge of the boat in case it should be necessary to take to the water. We promised Mr. Lowe a mail-bag of JOURNALS for his ship last autumn. They still wait his departure, and though a little old will keep till he goes.

IMPROVED ROOFING, SUITABLE FOR USE IN GAS WORKS.—Those gas-companies who are contemplating an extension of their establishments will do well to inspect the recently patented plan of Mr. Samuel J. Reeves of the Phœnix Iron Company, and Captain Meigs, of the U. S. engineers. The names are a good endorsement of the value of the improvement. Each span or rafter consists of a series of girders, so finished together as to form a continuous beam. This is bent to the desired arc, and rests by its ends on the walls. The manner of holding the ends of the bow thus formed together, and of distributing any weight resting upon one part of it to all parts of it, so that it shall form, practically, an inflexible arch, is the leading feature of the invention, and it is extremely simple and cheap in its accomplishment. The rods of iron, seven in number, for 125 feet span, are attached at equal distances apart to the bottom of the girder, and come together at a common centre, *which lies above the chord of the arc*, formed by the girder—*i. e.*, above the line of the tops of the walls. Thus each tie is a tension rod at all times, for a weight being placed on any part of the roof would tend to flatten that part and to bulge out some other part, which would be held in its place by the tie-rod. All the rods are set up to the proper tension by screws, simply attached, and all the joints are simply and cheaply made. The cost and weight of the compression pieces ordinarily used are thus avoided. The weight of all parts, except the girder, is about thirty per cent. of the weight of the girders, the whole weight being from twenty-five to thirty pounds per foot. We believe the cost is about $3 per foot.

OBSOLETE COLLIERY INSTRUMENTS.—An old "steel mill," used for lighting coal mines before the invention of safety lamps, has been presented to the Manchester (England) Geological Society, by F. C. Clark. It is now just about a century since this instrument was first introduced to the mining world, for the purpose of enabling the miner to prosecute his work in an atmosphere where he could not get a naked light to live, or where it was dangerous from explosive gas. He does not think that it was ever much used, except in cases of emergency or necessity: for instance, where a place was required to be pushed forward to relieve the air, or some such similar circumstance. The use of the instrument required great care and judgment, to ascertain whether the atmosphere into which it was about to be introduced was at the explosive point or not. Explosions have been known to have occurred from the use of it. The mode of using the instrument was by having it suspended round the neck with a belt of leather, while with the left hand you pressed the end against the breast, and held the flint to the edge of the wheel, and with the right hand turned the handle, which produced a succession of sparks that were more or less illuminated by the nature of the gas. Mr. Ralph Fletcher inquired if it were not strange that sparks alone should fire the gas? Mr. Dickinson said it did appear strange. The mill was never used now; and he had never himself seen it light fire-damp but having heard the statement frequently made he would rather not discredit it. The sparks would certainly light powder, and the flame of powder lights fire-damp, and possibly in some mixtures sparks alone might light fire-damp.

BOSTON GAS-METER WORKS.—This establishment, deprived of sufficient gas to move its diaphragms, has ceased to beat. It expired with July, 1860. We are among the mourners—in a small way.

$1,000 REWARD—A FLYING MACHINE WANTED.—The undersigned believes that aerial locomotion is possible for man as well as bird, when substantially the same conditions and arrangements are observed. The above sum is offered for a practical flying machine, adapted to individual locomotion, and will be paid for on the 1st of September, 1861, to the inventor who, at that time, shall produce the best machine for flying. The undersigned calls the attention of inventors to the fact that all creatures that fly accomplish it by the exertion of mere animal force. Whatever advantages the inhabitants of the air may possess by nature over man, may be more than matched by his ingenuity and skill. Let the inventors of the world no longer stable on the threshold of the grandest fact in the progress of the race by listening to absurd theories. *Flying is possible for man!* This offer is open to the inventors of all nations.

NEW-YORK, July 25, 1860. THADDEUS HYATT.

PATENTS.

Inventors are informed that Patents are procured at the Rooms of the AMERICAN GAS-LIGHT JOURNAL, through F. C. TREADWELL, Jr., Esq., an experienced Patent Agent and Expert.

UNITED STATES.

29,221.—J. T. Van Kirk. (Assignor to C. A. Van Kirk & Co.,) of Philadelphia, Pa., for an Improvement in Lamps:

I claim combining the tube, G, its rods, H, and coiled spring, e, with the flange or projection which inclose the lower end of the chimney or shade of a lamp, in the manner and for the purpose set forth

29,226.—R. W. Sievier, of Upper Holloway, England, Assignor to Wm. Lilley, of the State of Ohio, for an Improved Apparatus for Exhausting Atmospheric Air or Gases:

I claim the application to ships, mines buildings, &c., of a jet of steam or air in a shaft or flue in connection with the fan and director, when the said devices are constructed and arranged as specified, in the manner and for the purpose set forth.

29,260.—Wm. Fulton, of Cranberry, N. J., for an Improvement in Lamps:

I claim the peculiar construction of button, G, as shown in Fig. 5 and Fig. 6, or its equivalent, in combination with the gauze wire plates, C and D, as shown in Fig. 2, or the perforated plates, C and D, as shown in Fig. 3—the whole being arranged substantially as and for the purpose set forth.

29,261.—Henry Fellows, of Bloomfield, Ind., for an Improvement in Water Wheels:

I claim the attaching of the curved flanches, D, to the bottom of the penstock, A, so as to project within the wheel and form scrolls and water passages, e e, at the inner sides of the buckets or between the same and the shaft, C and chutes, E; all being constructed, arranged and operated in the manner and for the purpose set forth.

[This invention relates to an improvement in that class of water wheels in which the water is made to act upon the buckets both by impact and re-action. The object of the invention is to obtain a better combination than hitherto of the two forces or powers aforesaid, and consequently a more efficient wheel.]

29,262.—T. J. Fitzpatrick, of New Orleans, La., for an Improved Chimney Cap:

I claim the combination of cap, a, pipe, b, and bar c, made and operated as and for the purpose set forth.

29,263.—James Flattery, of Brooklyn, N. Y., for an Improvement in Faucets:

I claim suspending the valve vertically beneath the valve seat solely by the flexible disk or diaphragm, D, substantially as described, when said valve is completely detached from and acting independently of the spigot handle, G, in the manner and for the purposes specified.

29,266.—Birdsill Holly, of Lockport, Ill., for an Improvement in Pumps:

I claim the combination of the curve-flanged spout section, B, with the side plates, A A, and cross bolts, b b, so as to furnish a suitable and convenient support for the pump cylinder and its dependent parts, and a ready means of reversing the position of the spout; the whole constructed, arranged and operating substantially as specified.

I also claim the arrangement and combination of the adjustable fulcrum yoke, G, and arcs, L L, having adjusting holes therein with the lever, H, having a curved short arm with adjusting holes therein—all substantially as and for the purpose specified.

I also claim the connecting link, m, between the piston and valve, k, in combination with the notch, o, and the stop, w, operating substantially as and for the purposes set forth.

29,267.—Henry Humphreyville, Jr., of Strasburg, Pa., for an Improvement in Hot Water Apparatuses:

I claim the vessel, L, provided with a removable perforated partition, M, and valve, V combined with and secured to the furnace by means of the tubular screw, K, and adjustable bars, B B', on said furnace, substantially as and for the purposes specified.

29,271.—J. F. Hamilton of Pittsburg, Pa., for an Improvement in Pumps for Steam Engines:

I claim the use of the stopper or regulating valve, i, when placed in the receiving port, H, and used as described and for the purpose set forth.

29,278.—Enoch Hidden, of New York city, for an Improved Portable Water Closet:

I claim the combined arrangement of the hinged lid, D, with the flanch, s, the rubber packing, a, and bucket, L, with the removable seat piece, S—the whole constructed and operating as specified for the purposes set forth.

29,281.—C. W. Isbell, of New Haven, Conn., for an Improved Gas and Water Pipe Joint:

I claim the combination of the wedge-shaped cavity, the shoulder, F, and the upper and lower openings of the socket, A, with the wedge-formed portion of the pipe, B, the semi-circular or other projection, D, the recess formed between the end of the pipe, B, and the shoulder, E—the whole arranged substantially as specified for the purpose set forth.

29,287.—J. P. Lindsay, of New York City, for an Improved Cartridge Case:

I claim as a new article of manufacture, the cartridge case made with its chambers for receiving several charges, in combination with the discharging tubes or passages, when the whole is combined, arranged and fitted for use, substantially as described.

29,288.—Edward Landis, of Baltimore, Md., for an Improved Rocking Propeller:

I claim the arrangement of the rockers, E, with the wheels, B', the connecting rod, c, the crank, F, and platform, A, so that the motion produced by the rocking is converted into a rotary motion.

29,314.—H. E. Rogers, of South Manchester, Conn., for an Improved Candlestick:

I claim the construction and application of an elastic or spring thimble, d, secured within the upper end of a candlestick a, or cap, c, substantially in the manner as and for the purpose described.

29,316.—Gerard Sickles, of Roxbury, Mass., for an Improvement in Water Meters:

I claim the employment of the four puppet valves, C C D D, arranged upon one shaft within a pipe or chamber having four partitions, e e' f f', against the sides of which said valves are alternately seated, in combination with the piston, K; all substantially as shown and described, for the purpose set forth.

29,318.—Alexander Schwaninger, of Milwaukie, Wis., for an Improvement in Apparatuses for Generating Gas:

I claim the retort box, constructed with the ribs and arranged within the retort, as described, in combination with the arrangement of the pipes, whereby the retort and pipes are entirely surrounded by heat, the tar allowed to flow down, and the retort box or any one of the pipes can be removed without disturbing the other parts, as set forth.

29,321.—Sumner Sargent, of Watertown, Mass., for an Improvement in Lamps:

I claim the combination of the perforated lamp top, A, partition plates, b, and deflecting cone, B, substantially as and for the purpose set forth.

[The object of this invention is to obviate the difficulty attending the fluctuation of the air and the lamp, produced by the opening and closing of doors, the turning of the leaves of books, papers, &c. The invention is more especially designed for lamps which burn coal oil and other volatile hydro-carbons which require a considerable amount of oxygen to support a proper combustion, the flames of which are materially affected by an unequal supply of the same. The invention consists in dividing the air-chamber or perforated lamp top below the deflecting cone, into compartments, whereby the desired end is attained.]

29,223.—John Schatt, of Philadelphia, Pa., for an Improvement in Gas Meters:

I claim making the frame, A, with a projecting extension, 1 1, around the outer edge, substantially in the manner and for the purpose set forth and described.

29,324.—John Schley, of Savannah, Ga., for an Improvement in Lamps:

I claim the combination and arrangement of the tubes, B C D, with the two wicks, E E', button J, and body A, with or without the shade and chimney, L, as and for the purpose set forth.

[This invention relates to a lamp for burning coal oil and consists in a combination of parts arranged in such a way as to supply the requisite quantity of oil and oxygen, so as to obtain a brilliant illuminating flame.]

29,328.—C. N. Tyler, of Washington, D. C., for an Improvement in Gas Generators:

I claim, first, The generation of illuminating gas by the heat of the burner which consumes the same, when constructed as described, the flame serving the purpose of illumination and at the same time heating the retort or retorts, substantially as set forth, for the purposes specified.

Second, I claim enclosing the retort or retorts within a heater through which the draft passes, for the purpose of concentrating the heat, and thus producing a gas generating temperature from the illuminating flame, substantially as set forth.

Third, I claim placing the end of the gas-escape tube, C, at the hottest point of the retort or in the focus of heat, for the purpose of superheating a small jet of gas as it escapes to the burner, substantially in the manner and for the purpose set forth.

Fourth, I claim regulating the heat by the relative adjustment of the flame and heater, for the purpose of controlling the amount of illuminating flame, substantially as described.

Fifth, I claim the combination of stopcock, G, with the tubes A and C, for the purpose of admitting the flow of fluid directly to the burner, or conducting the same to the heater, K, and bringing the gas to the burner, substantially as set forth.

Sixth, I claim the revolving burner, D, in combination with the heater, K, and the retort or retorts, substantially as set forth for the purpose specified.

Seventh, I claim the peculiar mode of packing the stop-cock, B, by means of the level or levels compressing the cord (or other fibrous packing) upon the stem of the cock, substantially as set forth, for the purposes described.

29,333.—J. W. Truax, of Richford, Vt., for an Improvement in Water Wheels:

I claim, first, the auxiliary bucket, L, on the inclined rim, f, in connection with the conical rim, A, attached to the flanch, C, the parts being arranged relatively with each other, to operate as and for the purposes set forth.

Second, The employment or use, in connection with a draught cube B, of a valve, F, placed in such relation with the penstock, to perate as and for the purpose set forth.

Third, The arrangement of the penstock, D, flanch, C, draught tube B, and cross-bars or bridge trees, J, as shown and described, to render the wheel and parts pertaining thereto very accessible for repairs.

[This invention relates to certain improvements in that class of water wheels which are placed on a vertical shaft, are actuated by the re-active force of the water, and have a draught tube attached. The object of the invention is to economize in the use of the water by appropriating or applying the leakage water to the wheel, so as to make it subservient in driving the same, and obviating the friction hitherto produced by water-tight packing or joints.]

29,347.—James Adair, of Pittsburg, Pa., for an Improvement in Lamps:

I claim, first, The arrangement and combination of the adjustable tube, E, wick, F, containing the small central tube, g, tube, D, provided with the disk, a, and valve, b, at its bottom, and perforated below the disk, to communicate with the fountain, C, the thimble, G, and burner or tube, H, substantially as and for the purpose set forth.

Second, The hood, L, fitted to the perforated cylinder, I, and rendered adjustable by means of the cylinder, K, in connection with the deflecting lips, M, and the peculiar shaped orifice of the burner or tube, H, for the purpose specified.

[The object of this invention is to obtain a lamp by which volatile hydro-carbons may be burned for illuminating purposes without a chimney. The invention is more especially designed for burning coal oils of the heavier grades, which have not hitherto been successfully burned without a chimney, and, in fact, which cannot well be burned with a chimney when capillary attraction is chiefly depended upon for the supplying of the oil to the flame.]

29,364.—J. H. Davis, of Woburn, Mass., for an Improvement in Warming Apparatus:

I claim the construction and use of the horizontal reverse draft, flue, K K, with its fixed partition, H, its swinging partition, N, and jointed lever, I, and two vertical partitions, S S, and their valve, U, together with the inclined partition, A, as combined with the radiator, R, when arranged and combined in the manner and for the purposes specified.

29,377.—James Jackson, Jr., of Westerly, R. I., for an Improvement in Oil Cans:

I claim the oil passage, M, hollow space, N D, open at each end, and vent tube, E, combined and arranged substantially as and for the purpose set forth.

29,382.—J. H. Kalb, of Charleston, S. C., for an Improvement in Street Lights:

I claim the employment of the lamp, D, provided with gas burners F F, and reflectors, G G, when the same is used in connection with the gas pipe, K, posts, A, and the rods or bar, C C, and the whole arranged as and for the purpose specified.

29,401.—A. H. Phillippi, of Reading, Pa., for an Improvement in Gas Regulators for Railroad Cars:

What I claim is: In combination with the plane, disk, spring plates, a a', and their enclosed space, the valve, e, with its washer, f, flat space, g, and openings, h i, for the purpose of regulating the flow of gas from the receiver to the burners, whatever may be the pressure upon the gas, substantially as herein described and represented.

29,416.—G. A. Stanley, of Cleveland, Ohio, for an Improvement in Apparatuses for Molding Candles:

I claim the special arrangement of the molds in a circular form, in combination with a frame or box suitable for the purpose, in the manner and for the purpose substantially as described.

29,421.—Isaac Van Bunschoten, of New York City, for an Improvement in Vapor Lamps:

I claim, first, The relative arrangement of a supply tube, V, inclined conducting tube, A, inclined return tube, B, a heater, D a tubular burner, I, regulating valve, H, and air passages, U U, substantially as and for the purposes set forth.

Second, The arrangement of the two inclined tubes, A B, with respect to the heater, D a, and single screw plug C, of the heater, D a, substantially as and for the purposes set forth.

Third, The arrangement of the conical screw plug or valve, H, constructed with the cylindrical screw nut, R, in combination with the lower end of the vapor burner, substantially as and for the purposes set forth.

29,424.—Chapman Warner, of Brooklyn, N. Y., for an Improvement in Pumps:

I claim adjusting the pump cylinder, A, at the proper hight by means of the pendants, q, slats, o, and their attachments, as and for the purposes described.

RE-ISSUE.

Salmon Bidwell, of New York City (formerly of Chicago, Ill.), for an Improvement in Gas Regulators. Patented Sept. 21, 1858:

I claim a stop-cock, situated in, and controlling the passage way from the gas-holder or other source of supply to the variable chamber, in combination with the moving part of the variable chamber, substantially as described.

CODE, HOPPER & GRATZ,

1500, 1502 and 1504 FILBERT-ST., PHILADELPHIA.

MANUFACTURERS OF

Pressure Registers, Pressure Indicators, Pressure Gauges, Photometers, Governors, Station Meters, Customer Meters, (Wet and Dry,) Experimental Meters, (Wet and Dry,) Show Meters, (Wet and Dry,) Meter Provers, Centre Seals, &c.

The high reputation which we have enjoyed for more than twenty-two years, and the fact that we have manufactured a greater number of Gas-Meters than all other manufacturers in this country combined, must present itself as a security to parties desirous of securing the most reliable instruments. Having completed a most extensive addition to our Factory, and added many important improvements to our machinery, we are enabled to fill orders entrusted to us with dispatch, and in all cases *Guarantee Entire Satisfaction.* Our Patent Rotary-Valve Dry Gas-Meter is now used by upwards of Two Hundred Gas Companies, giving general satisfaction; we therefore recommend it, believing it superior to any other Dry Gas-Meter manufactured. All Meters tested separately by a sworn Meter-Inspector, and sealed when desired.

BURTIS' PATENT COMPENSATING COUNTERBALANCE FOR GASOMETERS.—This Improvement consists in making the attachment to the Gas-Holder by counterweights in such a manner as to effectually prevent it from getting out of level so as to bind, and also to prevent any escape of Gas at Cup or Hydraulic seal, where the Holder is on the Telescopic plan. Holders that work out of level, are thus evenly balanced, and prevented from binding or lodging against Tank-wall and falling down, thereby being rendered unfit for service. Where Holders or sections of Holders cannot be used on account of the above difficulties, this arrangement will remove them, and place the Holder in good working order; moreover, with this attachment, deep tanks are not necessary.

BURTIS' COUNTERBALANCE has been in use for three years at the Gas-Works, Chicago, Ill. Its resistance to high winds and snow-drifts, is alone sufficient to recommend its general adoption. For Engravings, see AMERICAN GAS-LIGHT JOURNAL for June, 1860, page 221. Address

P. T. BURTIS,
Engineer Gas-Works, Chicago, Ill.

C. R. WOODWORTH,
Manufacturer of
PORTABLE GAS WORKS,
74 WALL STREET.
New York City.

BUTLER'S PATENT PORTABLE Gas-Works are designed for Dwellings, Churches, Factories and Country Villages, as well as for large consumers in cities. They make gas from CRUDE ROSIN, and are WARRANTED to make as rich an article, at less than ONE-HALF the cost of that made by the old method in Portable Gas-Works, and at one-third the average price of Coal-Gas as sold in cities. Great savings in expense of light GUARANTEED to large consumers.

Works of all sizes furnished to suit applicants. Mains, Service and Distributing Pipes put in. Also, a large assortment of Gas-Chandeliers, and other fixtures, always on hand, at the lowest prices.

The MANSION HOUSE, BROOKLYN, with 250 burners in constant use, make their own gas with my apparatus, with results as stated above. This, (with a small one at my store,) can be seen in operation by application at my office, where descriptive pamphlets, with the names of numbers who are using them, will be furnished.

JOHN BUTLER,
Nos. 112 Fulton & 15 Henry-st., Brooklyn, N.Y.

FOR LIGHTING R. R. CARS, and Steamboats with Gas.—The whole process of filling the holders of a train requires but three minutes. Where the cars can stand on the track for thirty minutes, the gas is passed directly from the pump through the pipes and into the holders, thus doing away with the reservoir entirely; this may be done at either end of the road. This apparatus has been used on the New Jersey railroad nearly two years and for more than a year on the Camden and Amboy R. R., and the Philadelphia and Reading R. R. The Camden and Amboy R. R. Co. have the apparatus on all their cars, and on two of their Ferry Boats. The uniform flow of gas is secured by a Patent Regulator. This apparatus is also adapted to Steamboats making trips of not over three or four days in length, and to the head lights of Locomotives.

It can be seen in operation at the Rooms of the AMERICAN GAS-LIGHT JOURNAL. For Engravings, see AMERICAN GAS-LIGHT JOURNAL for June, 1860, page 245.

Apply to the
NEW YORK CAR & STEAMBOAT GAS CO.,
No. 117 Fulton street, N. Y.

GAS FOR THE COUNTRY.—C. WOOSTER, Manufacturer of Improved Portable Gas Machines, for Villages, Public Institutions, Churches, Hotels, Railroad Depots, Factories, Mills, Machine-Shops, Plantation Dwellings, &c. Office, 256 Canal street, near Broadway.

This Machine has been in successful operation for years, in many of the best residences and factories in the country, and for simplicity of construction, ease of management and economy of light produced, possess advantages over all other machines for the purpose now in use. It is adapted to the making of Gas from Crude Rosin or Rosin-Oil, producing a Gas of twice the illuminating power of Coal-Gas, at about one half the price usually charged for that gas.

Every Machine is sold under a strict guarantee to operate according to representation, and no payment required until the fact is demonstrated by actual use.

For farther particulars, and descriptive pamphlet containing references to numerous parties now using the apparatus, address

C WOOSTER,
No. 256 Canal-st., near Broadway, N. Y.

For Engravings, see AMERICAN GAS-LIGHT JOURNAL, for June, 1860, page 245.

☞ Responsible Agents wanted, with whom liberal arrangements will be made.

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For sale, at greatly reduced prices, WORTHINGTON'S STEAM PUMPS, extensively used by Gas-Light Companies. Also, a new and highly successful PUMP, driven by water-pressure, requiring no attention or repairs, and the most economical water-motor yet constructed.

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☞ ALL METERS SEALED BY THE STATE INSPECTOR.

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The undersigned has a valuable European invention for consuming Coal Tar as fuel in heating Gas Retorts. The same is patentable, and the advertiser desires some one who is engaged in the manufacture of coal gas to join him in patenting and selling the same. Documents will be shown showing a very large saving by the use of this process.

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The following certificate will establish the advantages of this improvement.

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The total quantity of tar consumed at these works was 3,8,310 gallons or 12,610 barrels, of 30 gallons each. From repeated experiments I find that 2 gallons of tar, burnt under this system, is equal in heating power to 1 bushel of gas coke. A bushel of coke is worth 4½d. (9 cents), so that each gallon of tar consumed realized a value of 2¼d. (5 cents.) Supposing the above large quantity of 12,610 barrels of tar had been offered for sale, we should scarcely have found a purchaser *at any price*; certainly its highest value would have been about ¾d. (1½ cents) per gallon, thus showing a net profit, by being able to consume it, of 1½d. (3 cents) per gallon, or £2364, 8s. 9d. ($11,762 18) per annum.

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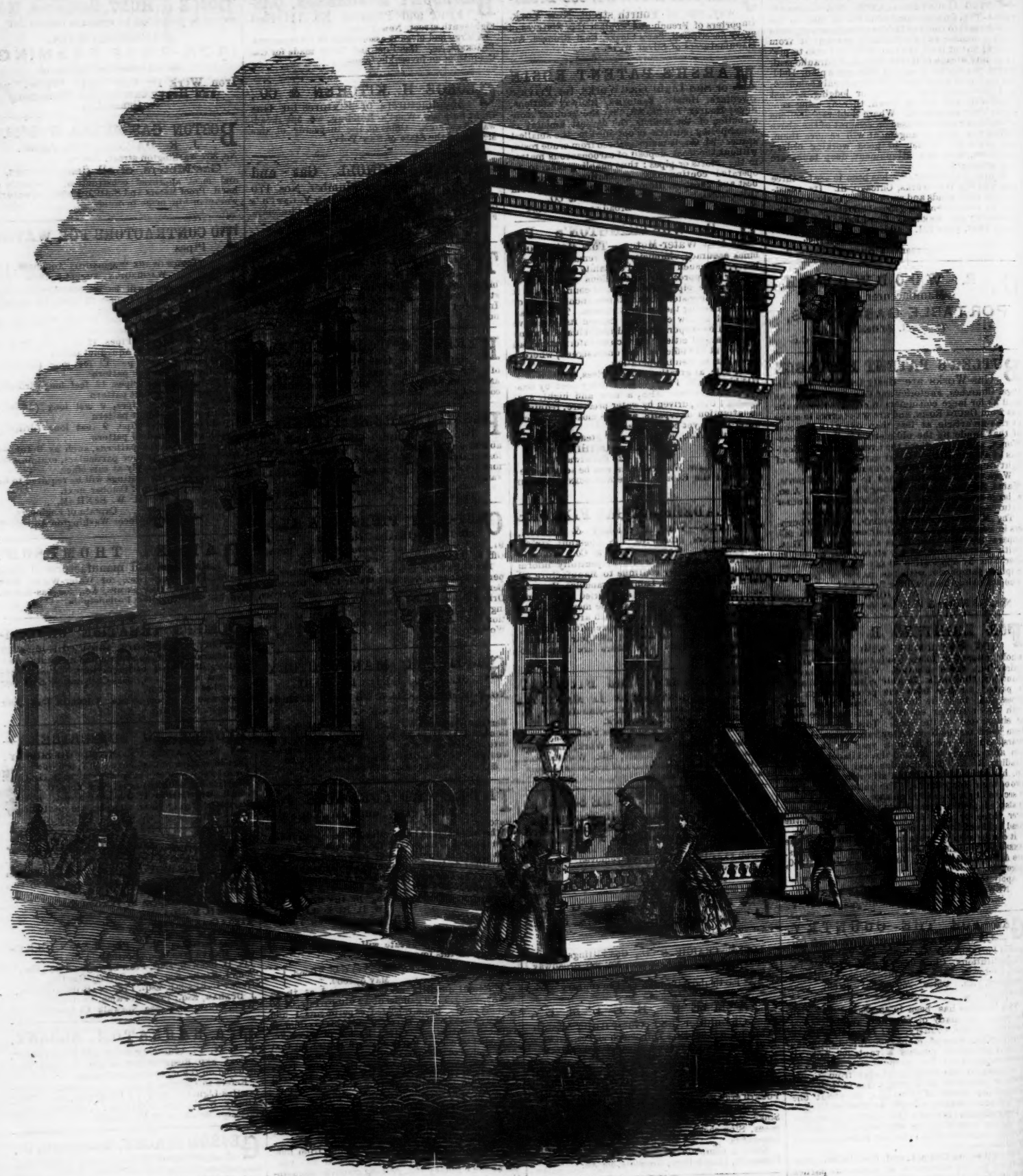

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The Candles manufactured by this Company are warranted to stand all climates, will not run or gutter, and require no snuffing and, unlike some other so-called Paraffine Candles,

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Complete in itself, without other machinery. Applied with founts to gas-fixtures in every variety; also, to hand-lamps such as use oil, burning fluid, coal oils, &c., making its own gas in the burner, *with entire safety from burning fluid.* Devoid of smell, smoke, or flicker; combining simplicity, economy and brilliancy of light in any temperature; adapted to and used by churches, factories, dwellings, hotels, steamers, railroad cars omnibuses, private carriages, street lamps, &c.; &c.—all at an expense of less than one cent per hour each burner. Call and see this light for the million, or send for circular,

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State and county rights for sale. Parties wanting gas in large or small quantities, should apply as above before making other engagements.

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FREEZING OF GAS-PIPES.—

Walton's Patent Anti-Freezing Apparatus illustrated by engravings, in the AMERICAN GAS-LIGHT JOURNAL, of Jan., 1860, page 141, is the most simple, durable and efficient of any known process.

According to Professor Faraday, the watery vapor contained in illuminating gas amounts to 0·0093 parts where the gas is at a temperature of 40°, or in other words, that there are 1 7-10 *gills water in every* 1,000 *cubic feet of gas* at that temperature. It is the deposit of this water in the form of frost that closes the exposed pipes.

Walton's plan is, in a few words, to supply this water with a sufficient quantity of alcohol (98–100ths), the vapor of which will enable it to pass through the most exposed pipes, unaffected by frost. Experiments of three years prove that one gill of such alcohol will protect 1,000 feet of gas at any temperature. Private houses, Hotels and Gas-works, can be thus guarantied from frost by the use of Walton's Anti-Freezer, which consists of but two or three small castings, at the most trifling cost. It can be applied at Gas-works without altering any of the pipes; and the expense of labor and the alcohol will not exceed two cents per 1,000 feet of gas.

It can be seen in operation at the rooms of the AMERICAN GAS-LIGHT JOURNAL, where orders will be executed at once.

Read the Following Testimonials:

GAS WORKS, CINCINNATI, O., 24th May, 1858.
MR. JOHN WALTON, Louisville, Ky.:

DEAR SIR,—At an earlier date, I intended to have written you the result of my experience during last winter, in regard to your patented apparatus to prevent the freezing of gas in pipes. I am quite convinced that both in theory and practice your apparatus is correct, and in no case will it fail to prevent the freezing in pipes of our illuminating carburretted hydrogen gas, provided attention is paid to renew the alcohol often enough in proportion to the amount of gas passing through the anti-freezing apparatus.

Yours truly, JOHN JEFFREY.

OFFICE LOUISVILLE, KY., GAS CO.,
March 30th, 1860.

In the winter of 1856, this Gas Company first applied John Walton's patent method for the prevention of Frost in Service Pipes,—to this date we have used it with perfect success. *This Company have Purchased the Right to this Patent for Louisville, Kentucky.*

The application of a vessel, containing a small quantity of alcohol, placed between the gas main and an open area connected with a building, through which the service pipe was laid, has always prevented the freezing or stoppage of the service pipe, although the temperature may have ranged from the freezing point to several degrees below zero.

As the alcohol absorbs from the gas any vapor of the water that may be passing off with it, after passing the vessel containing alcohol, there remains in the gas nothing that can freeze or close the pipe. *This simple application, we have proved to be an effectual safeguard against the closing of gas pipes with frost.*

ROBERT G. COURTENAY, President.

H. P. GENGEMBRE'S PATENT Non-Freezing and Non-Evaporating Gas-Meter Fluid.

A meter once filled with this fluid, costing only from 10 to 15 cents per gallon, will require no further attendance; will allow any amount of gas to pass through without affecting the level of the Fluid, and will work equally well in winter or summer, however exposed it may be.

I have appointed A. L. BOGART, No. 592 Broadway, New York City, my Agent for the New England States and the State of New York; and A. DOMY, Box 1180, Cincinnati, O., my Agent for the balance of the United States; but no assignment or licenses for using my patent will be valid without being ratified and signed by myself.

H. P. GENGEMBRE,
Box 48, Alleghany City, Pa.

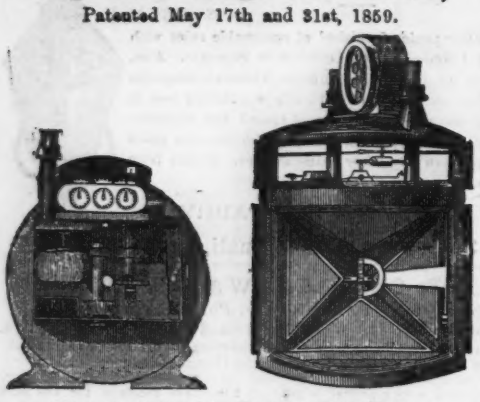
FRINK'S GAS-LIGHT Reflectors, For Show-Windows, Billiard-Tables, Desks, Churches, Halls, &c.

Frink's improved Day-Light Reflectors for obviating the use of Gas entirely in the day-time. Frink's Gas-Light Reflecting Shades for Banks, Offices, Parlors, &c. Frink's Concave Gas-Light Reflectors. No. 104 Worth street, third door east of Broadway, New York.

HARRIS & BROTHER'S

Improved Dry Gas-Meter,

Patented May 17th and 31st, 1859.



HARRIS & BROTHER,

MANUFACTURERS OF EVERY DESCRIPTION OF

GAS-METERS AND GAS-APPARATUS,

No. 1117 Cherry St., Philadelphia.

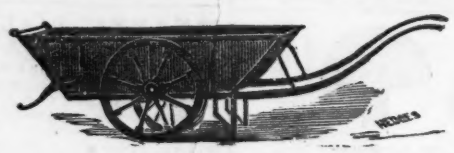
McKINNY & KELLY,

MANUFACTURERS OF

Coal-Scoops

AND

Coke-Barrows



FOR GAS-WORKS.

FURMAN-ST., Near Fulton Ferry, Brooklyn, N. Y. Samples are on Exhibition at the Rooms of THE AMERICAN GAS-LIGHT JOURNAL

WILLIAM ROY,

93 Beaver Street.

NEW YORK, IMPORTER OF THE CELEBRATED PERCETON FIRE-CLAY RETORTS the quality of which is superior to any other clay yet discovered. Analysis as under :

Silica	62.5	Magnesia	0.3
Alumina	35.0	Prox. of Manganese	0.2
Prox. of Iron	0.9	Phos. of Iron	0.5
Lime	0.6		

VITRIFIED FIRE-CLAY PIPES, from 2-inch to 36-inch, diameter, in lengths of two or three feet; are indestructible, and not affected by gases or acids.

Thomas Edington & Son's PATENT CAST-IRON PIPES are cast vertically to any weight required. They can also be coated with Dr. Smith's Solution, which prevents corrosion; adapted for gas and water. Made in lengths of nine and twelve feet, or turned and bored joints.

WROUGHT IRON TUBES and all materials for gas and water works, Fire-Bricks, Fire-Clay, Water Hydrants, Scotch and English Canne Coal, &c. Kennedy's Water Meters for measuring the flow of water—indispensable to all water companies.

TO GAS-FITTERS & PLUMBERS.—L. Waefeler & Co., No. 94 Beekman street, New York, have always on hand several hundred kegs WROUGHT-IRON GAS-PIPE HOOKS, of all sizes from ⅛ to 2 inches. They are made of best quality horse-shoe nail iron, and warranted not to break. Also, PLUMBERS' MATERIALS, such as China Wash-Basins, Closet Basins, Pan-Closets, Bath Tubs, Boilers, Brass and Silver-plated Cocks, Brass and Iron Pumps, Hydraulic Rams, French Fountain Jets, &c., all at the very lowest prices.

BUTTS & KENDALL, (Formerly F. Butts & Co.,) Dealers in STERLING COAL, Cleveland, Ohio.—The attention of Gas Companies is called to the following letters as to the merits of the above Coal, being a few of the many we have received, and from which we are led to believe that there is no English or American Coal which combines all the qualities desired in a Gas Coal as perfectly as the Sterling :—

Office of the Manhattan Gas Light Co.,
New York, January 13, 1860.

MESSRS. BUTTS & KENDALL :—*Gentlemen* :—Yours of 9th inst. is received. The "Sterling Coal" received from you during the past year worked very satisfactorily—averaging 9520 cubic feet of 15 candle Gas per ton of 2240 lbs, and 41 bushels of Coke, weighing 1465 lbs. We consider it among the best of American Gas Coals, for the quantity and quality of the Gas produced, and also for the excellent quality of its Coke. I am, Gentlemen, your obedient servant, CHARLES ROOME, Pres.

Office of the Rondout and Kingston
Gas Light Co., Rondout, Jan 4, 1860.

MESSRS BUTTS & KENDALL :—*Gentlemen* :—The 600 tons of Sterling Coal ordered from you in August, 1859, has now been in use over four months, to my entire satisfaction. Its average yield is 4, 40-100 feet, and a good strong light. The Coke produced equal in quality and quantity, to best English Coking Coals. It burns very freely with little clinker. In purification it is economical, using no more lime than New Pelton. It is superior to any American Coal I ever used. I shall be pleased to give you any further information at my office in New York.

WM. W. HAGUE, 522 Broadway.

The Cleveland Gas Light and Coke Co.,
Office, 195 Superior-St., Cleveland, Dec. 30, 1859.

MESSRS. BUTTS & KENDALL :—*Gentlemen* :—This Company has used between 3000 and 4000 tons of your "Sterling Coal," and are still using it with very satisfactory results. We find the average product of a ton of 2000 lbs. is about 8800 feet of Gas and about 37 bushels of Coke. The Gas is of good illuminating power and quite free from sulphur or other impurities, one bushel of lime purifying 9000 feet, and the Coke of very superior quality. The yield of Gas is about the same as from the Pittsburgh Coal, and the Coke better adapted to our use. Yours, truly, T. DWIGHT EELLS, Sec.

Office of the Sandusky, O., Gas Co., *Jan. 16, 1860*

MESSRS. BUTTS & KENDALL:—*Gentlemen* :—This Company has used your Sterling Coal since (July 3d, 1859, and are still continuing the use of it with satisfaction to the Company and consumers. The average product has been 8,629 feet of Gas per ton of 2,000 lbs, and 37 bushels of Coke of very superior quality. The Gas is as good as that obtained from Pittsburgh Coal I consider it the best Coal ever used in our works. I am, gentlemen, yours respectfully, WM HUDSON, Sup't & Sec'y.

We would also refer to Gas Companies in the following places :—New York City (Manhattan and New York Co's), Albany, Troy, West Troy, Rochester, Oswego, Rondout, Kingston, Albion, Brockport, Seneca Falls, Elmira and Lyons, in the State of New York; Cleveland, Toledo, Sandusky, Norwalk and Oberlin, in Ohio; Detroit, Ann Arbor, Grand Rapids and Kalamazoo, in Michigan; Coburg, in Canada, and two Companies in Milwaukie, Wisconsin.

The extensive Mines of the Sterling Coal and Mining Company, in the western part of Pennsylvania (known as the Sterling Hills, and the highest in that part of the State), are wholly under our control, and the Coal is mined and sold only by us or our Agents. The average product of the Sterling Coal, per ton of 2,000 lbs., is 8,733 feet of 15 ¼ candle Gas (4, 37-100 per lb.), and 37 bushels of Coke of very superior quality. Getting our Coal to this place by railroad, a supply can be had during the summer months (as well as at all other times), which is not the case with coals dependent upon high water for transportation, as are most or all other gas coals which are sent to the Lake ports for shipment. Our mining facilities are such, that we are prepared to ship extensively. For any further information address the undersigned, or M. BALLARD, Esq., Syracuse, N. Y., who is our Agent for that State.

BUTTS & KENDALL, Cleveland, O.

CORNELIUS & BAKER,

MANUFACTURERS OF

Lamps, Chandeliers, Gas-Fixtures, &c.,

MANUFACTORIES,

821 Cherry-St., and Fifth-St. and Columbia Avenue.

STORE, 710 CHESTNUT STREET,

PHILADELPHIA.

JOHN HEARN & CO., Dealers and Miners in AMERICAN GAS-COALS, Erie, Penn., would call the attention of Gas Companies to the superior quality of our Coals. For the past ten years they have been used by a majority of the Gas Companies in the State of New York, west of Albany and Troy. And also by the Gas Companies in the cities and towns of the North-Western States, and, during the past year, by the East Troy Gas-Light Company, Albany Gas-Light Co., and Manhattan Gas-Light Co. of the city of New-York,—all of which heretofore used English Coals.

Owning our mines and a fleet of vessels on the Lakes, having no Railroad transportation, and only 70 miles of canal from this city, or 140 miles of canal and Lake from Buffalo to the coal fields, being 175 miles less of transportation for Coal to the Seaboard, than any Coal Depot on the Lakes and having an Agency in Buffalo for the transhipment of our Coals only, it is unnecessary to say that parties purchasing of us, will get their Coal at first hand, saving, thereby, commission to managers and 175 miles of extra railroad and lake transportation.

A working average of our Beaver Coal is 9,500 feet of 16 Candle Gas, and 40 bushels Coal to the ton of 2,240 lbs.

The Manhattan Gas-Light Co of New York having thoroughly tested the Gas Coals of Pennsylvania and Ohio, the following extract from a letter to us will speak for itself:

"MANHATTAN GAS-LIGHT COMPANY,
"New York, June 15th, 1859.

"Messrs. JOHN HEARN & CO., Erie, Penn. :

"GENTLEMEN,—This Company has a contract with your firm for the delivery of five thousand tons of Gas Coal, half each Beaver and Mount Carbon, at $ —— per ton of 2,240 lbs.

"The cargo which has been received is satisfactory, and as we shall need 15 or 20 thousand tons more, to be delivered through the present summer, we beg you to advise us whether you desire to increase your contract. We have applications from various parties who desire to supply the Company, but shall be satisfied to get a larger quantity of your Coals, provided you can serve us on terms equally favorable with others.

"For the Gas Co.,
"HENRY YOUNG."

We are prepared to contract for the delivery of our Coals in the City of New York, or the cities and towns on the Hudson River.

CANNEL AND ORREL GAS-Coal.—The Subscribers are constantly receiving direct, from the celebrated mines of WILLIAM H. BRANKER & CO., NEWCASTLE, ENG., COAL of the very first quality for gas purposes, which they will sell direct from ship or iron yard at the lowest market price; and we guarantee the coal to be equal if not superior to any other coal brought to this market.

CORNELIUS BAKER & SON,
61 Leonard st. and 652 Hudson st., New York.

ANTHRACITE AND BITUMINous Coal.—We are now prepared to contract with Dealers and Manufacturers, at wholesale only, for the choicest varities of Lehigh and Schuylkill Coals, Pure Locust Mountain direct from the miners' hands, George's Creek Coal from Hampshire Mines at Baltimore, and Midland Co.'s Mines at Alexandria, unexcelled for Blacksmiths', Locomotive and Manufacturing purposes. At Elizabethport, N. J., we always have a full supply of Lehigh, Spring Mountain, Hazleton and Council Ridge Coals.

LEWIS AUDENRIED & CO., 110 Broadway,
86 State street, Boston,
205 Walnut street, Philadelphia.

TO BUILDERS OF GAS WORKS.—A valuable Corporation Grant for a Gas-Works, in a flourishing City in the State of Ohio, for sale. For particulars apply to

B. M. JOHNSON,
151 East 16th street, New-York City.

TO INVENTORS.—Patent Agency of the AMERICAN GAS-LIGHT JOURNAL.—The Proprietor of the AMERICAN GAS-LIGHT JOURNAL, is happy to announce that a

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Is now connected with these ROOMS, under the charge of

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Well known as one of the most prompt, reliable, and able Patent Agents and Experts in the United States.

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Inventors are cordially invited to visit the ROOMS of the AMERICAN GAS-LIGHT JOURNAL, Iron Buildings, Nos. 254 and 256 Canal street, East, near Broadway, NEW YORK.

INVENTORS' DEPOT & SALES Room for Patent Rights.—Parties desirous of placing with us valuable Patents, for the sale of Rights, on commission, will here find the Head-Quarters for Inventors and their Patents, as well as for parties seeking investments in articles of undoubted merit. The public are invited to call, or send for Circulars. New articles coming in daily. BUTLER, HOSFORD & CO.,
No. 30 Broadway, N. Y., Proprietors of the Paragon Self-Generating Gas-Light.

TO GAS COMPANIES AND CONtractors.—For Sale: Two sets Dry Lime Purifiers, 14 feet by 12 feet, 5 tiers of plates, 12 inch connections; and One Set Purifiers. 10 feet by 5 feet, 5 tiers of plates, 8 inch connections. A Station Meter, (square case) 8 feet front, 8 feet deep, and 7 feet high; register a 250,000 feet per diem. Also a quantity of Bench Castings, consisting of Sections of Hydraulic main, (D shaped pattern,) Stand, Bridge and Dip Pipes, together with a number of Composition-faced Slide Valves, various sizes, from 6 inches to 16 inches diameter.

Address the ENGINEER OF THE MANHATTAN GAS-LIGHT COMPANY, Foot of 18th-st., N. R., New-York.

CANNEL and COAL of the best descriptions for making GAS and COKE. As per Analyses in AMERICAN GAS-LIGHT JOURNAL for June 1, 1860, page 242.

GAS CANNEL, 17s., 15s. 6d. and 14s ₱ ton.
GAS COAL, 11s. 6d., 9s. 6d., and 8s 6d. ₱ ton.
STEAM COAL, 10s., 9s. 6d., and 9s. ₱ ton.
All free on board Vessels in Liverpool.

Hand Picked Cannel and Coal about 10 ₱ cent. additional. Concession in prices made for large quantities.

GAS APPARATUS of all descriptions, and on the most approved principles; also Purifying and other materials supplied.

ANALYSES, PLANS and ESTIMATES, and other information required, and the highest references furnished on application.

CONTRACTS for Materials and works entered into. No charge made for Superintending Shipments, Preparing Bills of Lading, or Passing Entries

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REFERENCES:

CHARLES ROOME, Esq., Pres. Man. Gas Co., N. Y.
J. K. BRICK, Esq., Eng'r Brooklyn Gas Co., "
Messrs. ELLIMAN BROTHERS, New-York.
F. T. WILLIS, Esq., Pres. Savannah Gas Co.
J. A. SABBATON, Esq., Eng'r. Man. Gas Co., N. Y.
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Messrs. E. V. HAUGHWOUT & Co. have on hand a most extensive assortment of the newest and most desirable styles of

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☞ Gas-fitting done in the most workmanlike manner, and on reasonable terms.

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Catalogues remitted to any address on receipt of six cents in P. O. stamps.

GAS ENGINEERS' LIBRARY.—The following works, indispensable to Engineers, Contractors and others engaged in the construction of Gas Works and manufacture of Gas, have been selected out of a large stock of chemical and other works, and are recommended to the attention of those interested.

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Chemistry applied to the Arts and Manufactures. By KNAPP, RONALDS & RICHARDSON. Fuel and its Applications; Coal, Gas, Oil, Spermaceti, &c., and their application to purposes of Illumination, Lighthouses, &c. 433 Engravings and Plates. Vol. 1, in two parts. $9.00.
CLEGG, (S.) Manufacture of Coal Gas. 3d ed., with plates. London, 1 vol. 4to. $10.00.
FARADAY, (M.) Chemical Manipulations. London, 1827. Very scarce. 1 vol. 8vo.
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